THE RELATIONSHIP OF COLLECTIVE STAFF EFFICACY AND MISSOURI HIGH SCHOOL ACT SCORES

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THE RELATIONSHIP OF COLLECTIVE STAFF EFFICACY AND MISSOURI HIGH SCHOOL ACT SCORES

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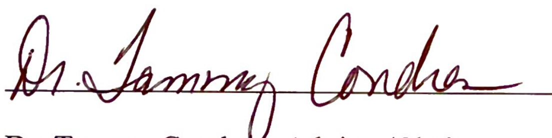

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THE RELATIONSHIP OF COLLECTIVE STAFF EFFICACY AND MISSOURI HIGH SCHOOL ACT SCORES

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The Faculty of the Graduate Education Department
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Doctor of Education

By

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I remember having a conversation with my Aunt Sissy regarding the idea of pursuing a doctorate. I was hesitant. Then I read a blog she had written about going for your goals. Her words helped solidify my decision, and I would be remiss if I failed to mention the impact she has had in this process.

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ABSTRACT

The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri public high school students' ACT Scores. Additionally, it could be beneficial for future educational leaders to gain insight into collective noncertified staff efficacy and how that may relate to building culture, school size, and as a result, student achievement. As school culture continues to transform with each generation of students and staff, it is imperative school administrators understand the importance of cultivating a positive learning environment for employees and students. The researcher utilized Goddard et al.'s (2000a) Collective Efficacy Scale to survey Missouri public high school certified staff members. Furthermore, through a pilot study, the researcher utilized a pilot in order to create a revised version of Goddard et al.'s (2000a) Collective Efficacy Scale used for noncertified Missouri public high school staff. A principal component analysis was utilized in the pilot and the researcher used a multiple regression analysis after gathering data from both surveys. Data from the certified staff surveys showed statistical significance, however, the effect size was very small. Data from the noncertified staff surveys did not show statistical significance.

Chapter One

Introduction

The impact of school culture on student performance has been an ongoing topic across the United States. Studies have provided a positive correlation between student academic achievement and a supportive school culture (Bieliune, 2018; Bozkurt et al., 2021; Fortenberry, 1991; MacNeil et al., 2009). Similar studies have identified a variety of attributes that contribute to school culture; these attributes include, but are not limited to, a growth mindset of teachers, location of a school, demographics of the area, and consistent leadership from building administration (Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). As school administrators continue to focus on improving school culture to optimize student performance, understanding the complexities of school culture is paramount.

Measuring the effectiveness of school culture has served as a dilemma for schools as culture, traditionally, has been measured through administrator-teacher relationships (Fortenberry, 1991). However, another aspect of school culture is the effect of collective staff efficacy on student achievement. Collective staff efficacy has played an imperative role in student outcomes including the perception of staff members' influence in the outcomes of student performance. Although Fortenberry (1991) conducted a study on measuring the efficacy of school staff on student retention, there has been a lack of research on correlation between the perception of the collective staff and student achievement, particularly when including both certified and noncertified support staff. The paucity of research understanding how collective certified staff efficacy compared to

collective noncertified staff efficacy is connected to student achievement creates a problem for assessing culture and the climate of a school (Fortenberry, 1991). As school culture proves to be an essential element in student achievement, the possibility of a relationship between collective staff efficacy and student achievement could inform leaders of variables and alternative methods in creating a positive school culture (Goddard, 2001).

Many studies have shown the relationship between the collective efficacy of certified staff and student performance (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). These studies have helped shape the collective efficacy of certified staff and the impact collective efficacy has on a school district. While these studies have shown the relationship of collective efficacy certified staff members have on student performance, little research has been completed on the relationship between collective noncertified staff and student achievement. Fortenberry (1991) conducted a study that focused on the climate of the school and noncertified staff. There have been multiple studies on teacher efficacy and student achievement (Cunningham & Farmer, 2016; Jalapang & Raman, 2020; Kim & Seo, 2018). However, more research with collective noncertified staff efficacy can help obtain further insight into how the joint collective certified staff and noncertified collective efficacy relate to student achievement.

This study included the collective efficacy of certified staff as well as noncertified staff and then examined the relationship between each group's collective efficacy and American College Test (ACT) scores (ACT, Inc., 2019). Furthermore, the information gathered helped determine if there is a relationship between collective staff efficacy of

certified and noncertified staff and Missouri public high school ACT scores. Chapter One introduced the reader to theoretical frameworks of self-efficacy and social cognitive theories, the problem statement, purpose statement, and the research questions. Finally, limitations, delimitations, design study, and definitions of key terms are discussed.

Theoretical Framework

This study utilized Goddard et al.'s (2004) perceived collective efficacy theory. Perceived collective efficacy represents the beliefs of the organization members regarding their collective performance (Goddard et al., 2004). Collective efficacy beliefs highlight the idea that members do not solely have individual self-efficacy, rather, organizations can achieve performance through their collective beliefs. For schools, collective efficacy can help support a positive culture and aid both certified and noncertified staff's awareness of collective efficacy in each building (Hoy et al., 2002). Furthermore, collective efficacy has been shown to increase student achievement in schools (Bieliune, 2018; Donohoo & Katz, 2019; Hoy et al., 2002; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). With positive culture and student achievement being tied to collective efficacy within a school district, it can be useful for school districts to develop consistent collective efficacy (Goddard et al., 2004).

This research will contribute to understanding collective staff efficacy in both certified and noncertified staff within a building, and as a result the building culture and student achievement. Many studies have highlighted collective teacher efficacy, however, there is a lack of knowledge on the complexity of certified staff efficacy within schools (Fortenberry, 1991; Kanwal et al., 2021). Additionally, the researcher sought to compare levels of certificated staff efficacy and noncertificated staff efficacy in relation

to student achievement. This study sought to determine if there was a relationship between collective staff efficacy as measured by Goddard et al.'s (2004) perceived collective efficacy and high school student ACT scores.

Problem Statement

With the culture and climate of a school being the foundation of how organizations can produce change (Kaleem et al., 2021; Smith & Shouppe, 2018), collective staff efficacy might serve as the representation of the culture and climate of a school (Gülşen & Çelik, 2021). Teacher efficacy is defined as teachers believing they can contribute to the learning of their students, regardless of the behavior and lack of motivation from students (Bandura, 1998, 2012; Goddard et al., 2000b). Past studies have indicated self-efficacy within teachers has a positive relation to the academic success of students (Bieliune, 2018; Fortenberry, 1991; Kim & Seo, 2018). Although studies have focused on teacher efficacy and collective teacher efficacy, there is a gap in understanding how noncertified staff efficacy can influence student performance.

Influencing school culture and student achievement can be difficult to navigate. A significant challenge for schools is understanding the influence school organizations have on the support of student achievement (Goddard et al., 2000b). The problem lies within understanding the overall picture, specifically, the effect both certified and noncertified staff self-efficacy have on student achievement. Being able to correlate noncertified and certified staff self-efficacy and ACT scores of students could give school districts a clearer understanding of the relationship between total staff collective self-efficacy and student achievement. Understanding the influence a school has on student achievement is difficult to assess due to factors like culture, climate, and

environment (Bieliune, 2018; Fortenberry, 1991; MacNeil et al., 2009). As school leadership continues to feel the pressure of contributing to high student achievement, particularly for high school students, the impact of school culture on standardized assessments becomes more significant (Bieliune, 2018; MacNeil et al., 2009). This study sought to determine the relationship between certified staff and noncertified staff collective self-efficacy and high school students' ACT scores.

Purpose of the Study

The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri public high school students' ACT Scores. Additionally, it could be beneficial for future educational leaders to gain insight into collective noncertified staff efficacy and how that may relate to building culture, school size, and as a result, student achievement. As school culture continues to transform with each generation of students and staff, it is imperative school administrators understand the importance of cultivating a positive learning environment for employees and students. Past studies have shown a positive school culture promotes growth for both staff and students (Bieliune, 2018; Fortenberry, 1991; MacNeil et al., 2009). Therefore, it is essential school leadership works to cultivate a positive culture, thereby enhancing collective staff efficacy (Çalik et al., 2012). For example, Çalik et al.'s (2012) study showed positive school culture had the strongest correlation among supporting teachers and collective efficacy. Though collective efficacy within a school has been studied involving certified staff (Cunningham & Farmer, 2016; Jalapang & Raman, 2020; Kim & Seo, 2018), more research on the effects collective noncertified staff efficacy has on the

culture of a school is needed. Positive culture can influence collective staff efficacy (Çalik et al., 2012; Goddard, 2001; Goddard et al., 2004), and can help provide support for students.

Research Questions

RQ1: What is the predictive relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores?

RQ1a: What is the predictive relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year?

RQ1b: What is the predictive relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year?

Hypotheses

In an effort to answer the aforementioned research questions, the following null hypotheses were investigated:

$H_0$1: There will be no statistically significant relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores.

$H_0$1a: There will be no statistically significant relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy

Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year.

$H_0$1b: There will be no statistically significant relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test score in the 2019-2020 school year.

Significance of the Study

As challenges facing school districts continue to rise with the pressure of increasing standardized test scores while cultivating an environment in which employees thrive in excellence, gaining insight into how to create an environment in which staff have positive self-efficacy is vital. Studies have shown schools that have positive learning culture can help with student academic growth throughout the year, regardless of the external factors limiting the school (Bieliune, 2018; Fortenberry, 1991; MacNeil et al., 2009). Research has been completed on collective staff efficacy in certified staff (Bieliune, 2018; Fortenberry, 1991; Kim & Seo, 2018), however, a lack of research exists on the collective efficacy of noncertified staff. Research conducted on collective efficacy of noncertified staff could help show whether a relationship exists between noncertified staff and student achievement.

Studies have shown collective certified staff efficacy does affect student learning (Bieliune, 2018; Fortenberry, 1991; Kim & Seo, 2018). Research has been lacking in the understanding of collective noncertified staff efficacy and the influence of collective noncertified staff efficacy on student learning and outcomes, with the most recent found being a study from Fortenberry (1991) over 30 years ago. This supports the need to

revisit this topic currently. Much of the research has centered around the relationship of collective staff efficacy from teachers and/or certified staff and student academic achievement (Cunningham & Farmer, 2016; Jalapang & Raman, 2020; Kim & Seo, 2018), therefore, it would be beneficial for schools and future research to gain insight on collective staff efficacy of noncertified faculty and student achievement.

This quantitative correlational study looked to examine the relationship between collective certified and noncertified staff efficacy and ACT scores of Missouri public high schools. The collective staff efficacy was measured by Goddard et al.'s (2000a) Collective Efficacy Scale and was related to ACT scores. Goddard et al.'s (2000a) Collective Efficacy Scale was given to both certified and noncertified staff to help gauge the collective efficacy in Missouri public high schools. Results from this study will help bridge the gap between collective certified and collective noncertified staff efficacy and sought to determine what, if any, relationship exists between student achievement and staff collective efficacy scores. It will also add to the base for educators to improve practice. This research will help advance understanding of how noncertified staff in Missouri public high schools could influence student achievement based on their levels of collective efficacy and how they perceive their role in the process. This study is important due to a better understanding of how staff, collectively, can help cultivate an environment that fosters academic achievement of students (Fortenberry, 1991).

Limitations

The limitations of the study were as follows:

- Sample size and school location
- Demographics of the school

- Population of the school
- Lack of prior research on this topic
- Lack of available/reliable data
- Participants interpretations and accuracy of answers

Delimitations

The delimitations of the study were as follows:

- Survey was only sent out to Missouri public high school.
- Use of Goddard et al.'s (2000a) Collective Efficacy Scale
- Researcher focused on relationship between collective efficacy of certified and noncertified staff and Missouri public high school ACT scores
- Participants must have been in a certified or noncertified position in a Missouri public high school

Assumptions

The assumptions of the study were as follows:

- Honest and truthful responses from participants
- Answers represented the given school district
- Selected sample size of school districts is a valid representation of data
- American College Test Scores were reliable and valid
- Scale was taken by a fair representation of certified and noncertified staff

Design Controls

This was a quantitative correlational study. Goddard's (2001) Collective Efficacy Scale was given to certified and noncertified staff to assess and measure self-efficacy;

each survey was used per the scope of the work towards certified and noncertified staff. Additionally, ACT data were obtained from Missouri Department of Elementary and Secondary Education unrestricted access database for each public high school in Missouri to determine whether there was a relationship between collective efficacy of both certified and noncertified staff and ACT scores. To maintain integrity, participants were ensured confidentiality. Survey results were in no way tied to specific individuals, but rather were reported as group data regarding a building's collective efficacy and then correlated to that building's overall ACT score average.

Limitations of this study consisted of school sizes, school locations, and demographics. Surveys were distributed to Missouri high school public administrators to forward to noncertified staff and certified staff to complete and return to the researcher. Controls were used to help influence the factors that come with limitations and delimitations. The researcher ensured confidentiality to participants to encourage honest answers. By ensuring confidentiality, participants were able to reflect on the selected leadership style of the district administration and give honest answers about collective staff efficacy. Additionally, definitions were provided at the beginning of the survey to help with consistent interpretation by the participant. Moreover, the researcher focused on the relationship between collective staff efficacy of certified and noncertified staff and Missouri high school ACT scores. To ensure accuracy of the population, the researcher utilized DESE's open access database and only selected participants working in Missouri public high school.

Other limitations were the lack of research on this topic, self-reported data, and lack of reliable data. Delimitations of this study included the use of Goddard et al.'s

(2000a) collective self-efficacy instrument, which was given to public high school certified and noncertified staff members in Missouri. The researcher also focused on the relationship between the collective efficacy of both certified and noncertified staff and ACT scores, and comparisons between the two types of staff.

The researcher assumed participants were honest and reliable with their answers as confidentiality was ensured. Additionally, it was ensured the ACT scores of the students were reliable and valid. According to ACT, Inc. (2022), the composite scores showed a Cronbach score of .97 utilizing 215 items (ACT, 2022). Lastly, the researcher assumed the Goddard et al. (2000a) test was viable and helped accurately gauge the efficacy of staff in each school district. According to Goddard et al. (2000b), there was a positive relationship between school-level teacher efficacy and collective efficacy ($r = .54, p < .01$); additionally, there was a positive relationship between trust in colleagues and collective efficacy ($r = .62, p < .01$). Furthermore, there was no significant relationship between collective efficacy and environmental press ($r = .05$, n.s.). The statistics noted helped establish the reliability and validity of Goddard et al.'s (2000a) collective efficacy scale used in this study.

Definition of Key Terms

Certified staff. Certified staff include principals, teachers, administrators, support staff, and other professional staff who work at participating schools (U.S. Department of Education, 2021).

Collective efficacy. Collective efficacy is a shared belief in the actions of management, or an organization is indicative of the product and/or advancement of various skills and talents (Bandura, 1997; Goddard et al., 2000b; Turkoglu et al., 2021).

Efficacy. Bandura (1998) explained efficacy is a person's belief that he/she may change a perceived outcome through their behavior, belief, resilience, effort, and susceptibility to depression and stress.

Noncertified staff. A variety of school employees who provide specialized instructional support that help support, promote, and enhance school learning; noncertified staff may work within a classroom or outside of the classroom in the fields of transportation, maintenance, office clerk, paraprofessionals, (National Center on Safe Supportive Learning Environments, n. d.).

School culture. School culture is the overall comprising norms and values of an organization as well as the rules by which people abide; school culture stems from an anthropological perspective and influences performance, well-being, and retention of students and staff (Brion, 2021; MacNeil et al., 2009; Stolp & Smith, 1995).

Summary

Collective certified staff efficacy is imperative to improve the environment of a school and to help with academic achievement (Çalik et al., 2012; Nurindah & Jafar, 2019). There has been much research regarding the understanding of collective certified staff efficacy (Cunningham & Farmer, 2016; Jalapang & Raman, 2020; Kim & Seo, 2018). However, there is a lack of knowledge and research in the relationship between noncertified staff efficacy and student achievement (Fortenberry, 1991). This research will fill the gap in literature where there is a lack of knowledge in the relationship between collective noncertified staff efficacy and student achievement. This quantitative correlational study focused on the relationship between certified and noncertified collective staff efficacy and ACT scores of Missouri high school students. Goddard et

al.’s (2000a) Collective Efficacy Scale was utilized as the instrument to help the researcher gather data needed to answer the research questions. The purpose of this quantitative, correlational study was to test Bandura’s (1997) theory of self-efficacy by relating collective self-efficacy of certified and noncertified staff to Missouri public high school students’ ACT scores. Chapter Two will include a review of related literature, organized thematically beginning with school culture, followed by self-efficacy, collective self-efficacy, and student achievement. Additionally, Chapter Two will align to the theoretical framework of Goddard et al. (2004), which highlights perceived collective efficacy. Chapter Three will include the methodology and research design. Chapter Four contains the findings of the research and Chapter Five will include the summary of the findings and suggestions for future research.

Chapter Two

Review of Related Literature

Introduction

Low-performing schools continue to remain a challenge across the world (Mosoge et al., 2018). Many governments have been able to provide low-performing schools with more finances in hopes it may help resolve low-performing status (Mosoge et al., 2018). Other low-performing schools have been placed under certain authorizations from the government or educational departments including new leadership for the school, closing of the school, or a reopening the school as a private school (Mosoge et al., 2018). With the amount of pressure on schools to achieve proficiency using limited resources, collective efficacy may be a resource schools can develop to no longer remain being seen as low performing (Guidetti et al., 2018; Mosoge et al., 2018). Multiple studies have supplied a positive correlation between collective teacher efficacy and student success (Buonomo et al., 2020; Surana, 2021; Thornton et al., 2020), however, there is a gap in literature relating to a correlation between student success and collective efficacy of noncertified staff (Fortenberry, 1991).

Bandura's (1994, 1997, 1998) social cognitive theory laid the foundation for self-efficacy and suggested people exercise some control over their lives. Bandura (1994) stated, "Perceived self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Self-efficacy beliefs determine how people feel, think, motivate themselves and behave" (p. 71). Further research has been completed regarding the impact that self-

efficacy has on an individual (Bandura, 1994, 1997, 1998; Goddard et al., 2004; Liu & Gumah, 2020). Bandura (1994) explained there are four sources of self-efficacy: mastery experiences, vicarious experiences, social persuasion, and affective states (Goddard et al., 2004). Although self-efficacy is imperative for the development of an individual (Bandura, 1994), it is important to note self-efficacy, collectively, can influence an organization (Hoy et al., 2002). Hoy et al. (2002) stated the beliefs of individuals in a group can have conjoined capability to produce preferred outcomes. The set of conjoined beliefs and capabilities from a group is called collective efficacy (Goddard, 2001; Goddard et al., 2004; Hoy et al., 2002). Collective efficacy can be applied in any organization with multiple individuals working for a desired outcome (Goddard et al., 2004).

From an educational lens, collective efficacy can be important for student success within a school district (Goddard et al., 2004). Past research has shown the importance of teacher efficacy and student achievement (Bieliune, 2018; Fortenberry, 1991; Goddard, 2001; Goddard et al., 2004; MacNeil et al., 2009; Salloum, 2022). Teacher efficacy can be achieved through proper and continuous training, which can help increase collective staff efficacy within a school (Bandura, 1994; Lowder, 2017). Goddard (2001) also stated, within a school, past success may increase collective teacher efficacy while failures may cause the collective staff efficacy to decrease. Furthermore, having strong collective efficacy can help establish the norms and environment of a school by encouraging staff to continue to pursue excellence in student achievement (Goddard, 2001; Goddard et al., 2004).

Although there has been much research in certified staff efficacy, there is a gap in current literature regarding the noncertified collective staff efficacy within a school district (Fortenberry, 1991; Goddard et al., 2004). Since Bandura (1994) noted collective efficacy can impact an organization, it could lead one to wonder about the importance of how noncertified collective staff efficacy can impact academic success of students. Fortenberry (1991) found in one school district, noncertified staff worked closely together and were more goal oriented than certified staff.

This chapter includes an introduction of the literature review and is organized thematically. The origins of self-efficacy and collective efficacy will be discussed as well as student achievement and school culture. Furthermore, the purpose of the literature review is to conceptualize the framework of culture and self-efficacy to better understand the viewpoints of collective staff efficacy in a school organization through the lens of Goddard's et al.'s (2004) perceived collective efficacy. Through the literature review, this study sought to gain insight into establishing a positive culture that could enhance collective staff efficacy and further student achievement.

Theoretical Framework

This study was based on Goddard et al.'s (2004) theory of perceived collective efficacy. Perceived collective efficacy is the combined members' collective belief regarding the performance of the organization (Goddard et al., 2004). Collective efficacy is the product of interactive dynamics at the group level, which is indicative of the sum of the individual attributes (Goddard et al., 2000b). As Goddard et al. (2000b) stated, "It is 'the groups' shared beliefs in its conjoint capabilities to organize and execute course of action required to produce given levels of attainments" (p. 482). Furthermore, collective

efficacy is the performance capability of the entire organization (Goddard et al., 2000b, 2004).

This theory of collective efficacy has continued to evolve since Bandura (1997) started highlighting the power of an organization based upon collective efficacy (Bandura, 1997). Uline et al.'s (1998) framework was founded upon two ideas from Rotter (1966) and Bandura (1998). Bandura (1998) argued the idea of teacher-perceived self-efficacy while Rotter supported the amount of control teachers had over their environment to accomplish a task. However, both theorists believed teacher efficacy drives effort via motivation and establishes persistence in working through various problems. A focus on teacher efficacy originated from past studies that delved into self-efficacy and collective efficacy within an organization. Self-efficacy can be defined as the ability to have confidence in performing specific outcomes (Bandura, 1998). Furthermore, Bandura (1998) stated the following factors can influence preferred effect on outcomes: vulnerability to stress, level of work ethic, resiliency, and ambitions of an individual. Lastly, one can grow in self-efficacy through knowledge and understanding of the topic and how one may be able to predict the outcome, thus, aiding in his/her self-efficacy (Bandura, 1998).

Due to the complexity of environments a teacher may face, establishing consistent collective efficacy across all teaching platforms can be arbitrary. Understanding some teachers may feel more confident based on the subject being taught, the environment, and even instructing certain groups of students can help guide learning and growth for teachers. Therefore, combining the teaching context and environment with positive self-perception of teaching can bring forth teacher self-efficacy, which can help aid perceived

collective efficacy within a building (Goddard et al., 2000b).

Organizational Culture

All organizations have a perceived culture and climate. Culture, within an organization, includes the shared beliefs, values, or impressions of the employees within an organization; furthermore, culture stems from the perspective of the employees, symbols, myths, values, and future visions of the company (Bolman & Deal, 2017; MacNeil et al., 2009). Reeves (2009) added the idea that culture represents the attitudes, behaviors, and beliefs of individuals or groups. Individuals and groups are then motivated to adopt the current culture of an organization, or they bring their own culture to the organization (Gruenert & Whitaker, 2019). As organizations begin to consider their own culture, it is necessary to grasp the intricacies of changing culture within an organization and which factors can influence change (Gruenert & Whitaker, 2019).

Shifting the culture of an organization can take time and is not always straightforward. According to Reeves (2009), there are four imperatives of cultural change within any organization. First, leaders must determine what part of the culture will not change. Communication of the traditions, values, practices, and relationships that will not differ from the past need to be noted by the leader. Establishing the need to keep prior traditions, values, practices, and relationships can aid in keeping the people in the organization from feeling ineffective in their past experiences. Leaders may also be able to diffuse any sense of ineffectiveness by explaining the importance of what should remain consistent.

Second, the actions of the leader will show change. To change the culture of an organization, leaders should initiate change through their own actions and not strictly

through verbal communication. Although spoken communication is imperative for any organization, leaders must be able to lead through their actions and cultivate a new culture by establishing new norms, beliefs, and impressions for their employees.

Next, Reeves (2009) noted promoting the right leader to management will cultivate change. Understanding the complexities of how to manage, lead, and cast future vision is imperative for leaders. Recognizing the constant need for various strategies and knowing the pulse of the organization are vital. Bolman and Deal (2017) added that all organizations have a person who is the interpreter to the chief. This aids organizations as they have a mediator who can help provide clarity to the leader; therefore, leaders can rely on the interpreter to help gauge the climate of the organization.

Finally, change requires servant leadership and persistent attention to details (Reeves, 2009). Aspiring leaders ought to serve the organization by paying attention to details and picking up minuscule, even mundane, tasks that others may deem unfit for their position (Reeves, 2009). In taking a servant leadership approach, one may create an opportunity to start a change in values, norms, and beliefs of an organization. These four imperatives can help cultivate cultural change within an organization and indirectly affect the climate of the organization (Reeves, 2009). As a team discovers its soul, peak performance will appear (Bolman & Deal, 2017).

Factors of Cultural Change

Culture can be influenced by two categories of factors: organizational factors and operational factors (Susca, 2019; Torres, 2022). Organizational factors refer to the overall culture of a company and the top-down leader approach that emphasizes vision, mission statement, management style, external influences, and business strategy. Operational

factors are the attributes of the culture where the service is provided within the organization. Worker engagement, leadership approach, layout/planning of facility, logistics, and history of the facility/equipment can all attribute to operational factors that influence the overall culture (Bolman & Deal, 2017; Cansoy & Parlar, 2018; Elliott & Hollingsworth, 2020; Susca, 2019).

Similarly, Bolman and Deal (2017) expanded on culture by examining leadership through four frames: structural, human resource, political, and symbolic. Each frame examines a different point of view from the leader and can help shape culture within an organization (Bolman & Deal, 2017). For example, a leader may view a situation through the human resource frame, which would focus on the how people fit within the organization (Bolman & Deal, 2017). Other frames include the political, structural, and symbolic frames (Bolman & Deal, 2017). These frames all add various ways that culture is impacted by leaders and how leaders can encourage change within organization. Bolman and Deal attested the political frame, which is viewed as creating opportunities where issues can be renegotiated while new alliances are formed within an organization. The structural frame, which is viewed like a factory, can help culture by communicating, forming, and implementing procedures and processes (Bolman & Deal, 2017). Lastly, the symbolic frame, which places people as the heart, can help spur and continue the traditions and distinguish purpose within the culture of an organization (Bolman & Deal, 2017). Each of these frames can help a leader determine the approach needed in order for cultural change. Furthermore, a leader can use each lens for a situation in order to help break personal bias and view situations as a whole (Bolman & Deal, 2017).

Although factors of culture can be separated into two categories, the impact of leadership style is independent of the culture (Mitrovic, 2019). Susca (2019) stated the culture of a company is indicative of senior leadership. Both Mitrovic (2019) and Susca agreed culture can affect a new leader of an organization, however, over time the leader can influence the culture according to the leadership style of the new leader. Lastly, the leadership and organizational culture are an interactive relationship in which the culture can constantly shift and transform (Mitrovic, 2019).

School Culture

Smith and Shouppe (2018) asserted educational environment is constantly changing due to the steady pressure of external stakeholders as well as the methods through which students learn in unique ways; additionally, Portela and Pino-Juste (2020) added schools are pressured to innovate new styles of learning due to the fast pace of societal advances. School culture has been studied for centuries as well as the promotion and advancement of school culture (Smith & Shouppe, 2018). School culture is commonly defined as the glue that holds a school together (Gülşen & Çelik, 2021). Furthermore, school culture can help convey certain ideas and structures schools need to improve culture and climate (Cunningham & Farmer, 2016; Portela & Pino-Juste, 2020).

Research has shown schools help create and cultivate culture and school principals can play a major role in the representation of the culture (R. Atasoy, 2020; Karada & Öztekin, 2018; Tonich, 2021). Developing schools, in time, create and maintain their own culture and identity (Karada & Öztekin, 2018). As Karada and Öztekin (2018) stated, school culture is also an end result of information that is consistently being renewed and adopted. Humor, shared values, storytelling, rituals, and

ceremonies are all a part of a framework that helps implement and cultivate culture within a school (Bolman & Deal, 2017; Karada & Öztekin, 2018). Bolman and Deal (2017) highlighted how humor and friendly banter among a high stress level organization members can help ease tension as well as resolve daily issues (Bolman & Deal, 2017). Storytelling can also assist with maintaining traditions and provide examples for daily behavior within a high-performing organization (Bolman & Deal, 2017). Furthermore, relationships between colleagues and communication networks are all additional parts of a framework that make up a school culture, which, in turn, are said to be prerequisites for an effective school (Karada & Öztekin, 2018). School culture has an influence on teacher perceptions, which can help influence school personnel to establish efficacy and impact student achievement (Min, 2019). Lastly, the relationship between principal and teacher as well as between teachers can play a vital role in the culture of a school district (Karada & Öztekin, 2018; Min, 2019).

Since school culture is indicative of how schools continue to develop and grow (Cunningham & Farmer, 2016; Portela & Pino-Juste, 2020), it is important to show how collective efficacy can contribute to school culture. With collective efficacy influencing the perceptions, motivations, and feelings of success from staff, efficacy has been shown to be a major contributor to school culture (Donohoo et al., 2018). As educators share a sense of collective efficacy, school cultures can be influenced by high expectations for student success as well as a growth mindset (Donohoo et al., 2018). Donohoo et al. (2018) stated, when educators have positive collective efficacy, the view of students' successes and student failures does not focus on what was done or not done, rather, how teachers can solve problems collectively (Donohoo et al., 2018). Additionally, one study

showed how collective efficacy played a vital role in the overall job satisfaction of educators (Buonomo et al., 2020). When collective efficacy is present within a school culture, educators' efforts are heightened especially when challenges arise (Donohoo et al., 2018).

Measuring School Culture

According to Schein (1990), three levels of culture help articulate and measure the culture of a school. The first level is tangible artifacts. Tangible artifacts encompass many of the daily routines, ceremonies, and rituals that are most obvious to a bystander (Schein, 1990; Stolp & Smith, 1995; Susca, 2019). Additionally, tangible artifacts may be the feeling a person gets when they walk into an organization (Schein, 1990; Stolp & Smith, 1995). The second level of culture is values and beliefs (Schein, 1990; Stolp & Smith, 1995). Values and beliefs are symptomatic of the daily routines and actions of the people within an organization. Whatever is important or valuable to a person predicates the actions of the individual; the action of every individual, collectively, will be based upon the group's combined individual experiences (Schein, 1990; Stolp & Smith, 1995). Finally, the third level of culture is the underlying assumptions of an organization. Underlying assumptions may be difficult to recognize, however, these assumptions consistently shape the culture of the organization. For example, if a daily schedule changes due to a leadership decision, the noticeable change is on the forefront of the organization and takes time to gradually become the new norm of the daily schedule. Thus, shifts of routine and of daily regimen of an organization can cause culture to shift dramatically (Schein, 1990; Stolp & Smith, 1995).

Collective Norms and Beliefs

The collective norms and beliefs of an organization stem from the organizational culture (Lee, 2020). Additionally, school organizational culture uses pressures of external environments to change the internal problems (Lee, 2020). Goddard et al. (2000b) agreed norms and beliefs of the collective teachers help shape the culture of the school and the climate. The collective norms and beliefs of a school are based upon the viewpoints of the teachers and whether they believe the faculty can influence student achievement (Goddard et al., 2000b).

Student Achievement

Many studies have been conducted on how school culture affects student performance and what elements affect school culture (Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). Among these studies are varied perspectives on the cultivation and implementation of school culture. Ruiz et al. (2018) argued surrounding neighborhoods and communities play a significant role in the safety and culture of a school district. Smith and Shouppe (2018) agreed the surrounding community plays a role in culture of the school but argued principals and teachers who lead well and support the students can directly change the culture of a school; furthermore, they noted a principal can impact the quality of the education in a school by implementing data-driven decision making, and ensuring a vision and strong leadership. Additionally, Wong et al. (2019) stressed the social aspect of the student and how peer pressure can be a major motivator of behavior causing school culture to change.

School safety also plays a vital role in student perception of school culture and the outcome of student performance. Ruiz et al. (2018) and Smith and Shouppe (2018)

attested to the priority of a safe environment for students to support a positive learning environment. Both agreed lower socioeconomic and high-crime areas have schools where students feel unsafe, and thus can be a factor resulting in lower student achievement within those schools. Ruiz et al. and Wong et al. (2019) noted principals and teachers could help foster safe schools by supplying support for the students and frequent monitoring of the rules. Lastly, Wong et al. found substance abuse, depressive symptoms, and bullying were higher in schools where students perceived their teachers as neglectful and unsupportive.

School Climate

Job demands, atmosphere, and conditions at work describe school climate (Türker & Kahraman, 2021). School climate can also influence students. Smith and Shouppe (2018) claimed students who are in a poor climate at school may feel abandoned in classrooms and unsafe. A school climate that stresses quality opportunities and expectations, both inside and outside of the classroom, can help provide students with a safe educational environment (Smith & Shouppe, 2018). Conversely, students who are in a poor school climate may not learn properly and could show symptoms of disrespect, minimal social gains, and decreased social maturation (Smith & Shouppe, 2018).

Collective Efficacy

Collective efficacy refers to the belief that a group or organization has given a set outcome on their performance (Goddard et al., 2000b, 2004; Sánchez-Rosas et al., 2022). The concept of collective efficacy has stemmed from self-efficacy and Bandura's (1997, 1998) social cognitive theory. Studies have shown a correlation between self-efficacy and collective efficacy. For example, a person's self-efficacy can be influenced by the

collective efficacy of a group or an organization (Habeeb et al., 2019). These types of studies have included athletes (Habeeb et al., 2019) and chamber musicians (Ray & Hendricks, 2019). Much research has shown collective efficacy can have positive influence on teacher dedication (Al-Mahdy et al., 2018; Cansoy et al., 2020; Fathi et al., 2021; Qadach et al., 2020), belonging (Al-Mahdy et al., 2018; Skaalvik & Skaalvik, 2019), leadership (Hinson, 2018; Olivier & Hipp, 2019), and work satisfaction (Barnes et al., 2018; Buonomo et al., 2020; Gonzales et al., 2020). Additionally, collective efficacy can help with student achievement (Goddard et al., 2000b), which will be discussed later. Furthermore, it will be important to discuss how self-efficacy has helped with the basis of collective efficacy; as with self-efficacy, collective efficacy is related to tasks, shared ideas, stress, and accomplishments of the group (Goddard et al., 2000b).

Background of Self-Efficacy

Bandura (1994) stated perceived self-efficacy is defined as the personal belief of competence about a situation when a person performs at a desired outcome. Self-efficacy is the belief that influences how people behave, think, motivate themselves, and feel about themselves (Bandura, 1994; Engin, 2020). The influence self-efficacy has on a person affects four major processes: cognitive, motivational, selection, and affective processes (Bandura, 1994). Murphy and Johnson (2016) explained there are distinct types of efficacies: general efficacy and specific self-efficacy. General efficacy is the perception of the ability of an individual to perform in many circumstances (Murphy & Johnson, 2016). Specific self-efficacy is the belief of an individual using influencing motivation, enabling cognitive resources, and taking steps of action towards a specific goal under certain circumstances (Murphy & Johnson, 2016). Bandura (2012) also

promoted the precise measurement of self-efficacy in relation to a particular circumstance. Given the parameters of a school setting, efficacy was regarded as specific self-efficacy throughout this study.

Goddard et al. (2004) stated efficacy judgements are the beliefs regarding a group or individual capability to complete a course of action. A keen sense of efficacy can help develop personal well-being and human accomplishment (Bandura, 1994; Doennig, 2019). People who develop the skill of self-efficacy can face demanding situations such as challenges rather than shy away from the assessment (Bandura, 1994). These individuals can stay consistent in their efforts while recovering their sense of efficacy if failure arises (Bandura, 1994). As Bandura (1994) explained, individuals with high self-efficacy can have control over threatening situations by having a positive outlook that reduces stress, lowers vulnerability to depression, and produces personal achievements (Bandura, 1994).

Conversely, people who doubt their beliefs and capabilities shy away from difficult tasks (Bandura, 1994). People with low self-efficacy may find it challenging to have high aspirations and goals (Bandura, 1994). Setbacks and weaknesses may cause people with low self-efficacy to recover slower when failures arise (Bandura, 1994). Bandura (1994) explained these individuals can succumb to depression and stress quickly.

Collective Efficacy in Education

Goddard et al. (2004) stated perceived collective efficacy, within an organization, represents the members of the group's beliefs about the capabilities of the organization. The collective beliefs of the individuals of an organization make up the social norms that can be imperative for a school (Putney & Jones, 2019). Additionally, as teacher efficacy

may affect student achievement in one classroom, collective staff efficacy within a school organization can have an overall effect on student success (Goddard et al., 2000b). Bandura (1997) explained teachers are presented with a plethora of challenges that can cause collective efficacy to be difficult to achieve, however, collective efficacy should be an improved focus for each school district. Goddard et al. (2000b) affirmed collective teacher efficacy has a positive influence on student achievement and school leadership should lead schools to enhance teacher efficacy. For example, Lu and Mustafa (2021) suggested collective efficacy impacts student engagement when it came to lessons and their learning outcomes. Hoy et al. (2002) agreed, stating the collective efficacy of teachers within a school can help students achieve success.

Sources of Collective Efficacy

Although measuring staff efficacy can be completed through surveys and other forms of assessments, there are three factors that can show growth in collective efficacy (Bandura, 1998). Bandura (1998) found influencers of growth can be shown through mastery experience, social modeling, and social persuasion. Mastery experience stems from having resiliency through failure and not expecting quick results; when a group is able to show resiliency, efficacy can grow (Bandura, 1998). The second influence of collective efficacy is social modeling. Watching others succeed or fail through similar experiences can influence individual self-efficacy, as well as collective efficacy, within an organization (Bandura, 1998). Lastly, social persuasion is a way for leaders to impact staff efficacy by supplying opportunities for others to grow in success and offering feedback for achievements. Through all three factors, Bandura (1998) described that reducing stress and depression within an organization can help influence efficacy.

Bandura (1994, 1997) stated there are four sources of collective efficacy: Master experience, vicarious experience, social persuasion, and affective states. These four sources help aid the individual while also developing collective efficacy beliefs (Bandura, 1994; Goddard et al., 2004). The following sections provide insight on the four sources of collective efficacy.

Collective Mastery Experience

The first source of self-efficacy Bandura (1994) noted was mastery experience. Mastery experiences is the strongest sense of efficacy (Bandura, 1994; Goddard et al., 2004). Goddard et al. (2004) showed a person's perception of a successful performance can increase efficacy as well as increase the ability of future performances. Conversely, a person's perception of a failure can causes lower efficacy beliefs and will not enhance successful performances in the future (Bandura, 1994; Hoogsteen, 2020). There are attributes that contribute to the belief of perceived self-efficacy and collective efficacy (Bandura, 1994; Goddard et al., 2004). If the success of an individual is indicative of an internal or controllable cause (i.e., effort or ability), the self-efficacy beliefs are amplified (Bandura, 1994; Goddard et al., 2004). Furthermore, Goddard et al. (2004) stated if success is attributed to the intercession of others or luck, then efficacy beliefs may be stifled.

As mastery experience influences individual self-efficacy, collective mastery experience can influence an organization (Bandura, 1998; Haug & Wasonga, 2021; Hoy et al., 2002). Mastery experiences are gained through learned behavior of group members, thus collective learning occurs (Goddard et al., 2004). Goddard et al. (2004) stated schools through experience and confidence from those past successes; however,

consistent failures tend to stifle collective efficacy. V. Atasoy and Çakiroğlu (2020), highlighted previous performance is the catalyst that predicts future collective efficacy within an organization. These collective mastery experiences help shape an organization and form the efficacy of the collective group (Goddard, 2001; Goddard et al., 2004; Haug & Wasonga, 2021; Hoy et al., 2002). Goddard et al. (2004) explained the level of collective efficacy is predicated upon the history of a school's achievement.

Zhou (2019) noted schools learn from direct experiences, whether positive or negative. Positive experiences help schools grow in collective efficacy while negative experiences tend to diminish efficacy (Zhou, 2019). Many factors weigh into the outcome of collective efficacy within an organization. For example, if a group of teachers is successful based upon the attributes of a team (hard work, persistence, dedication, etc.), collective efficacy will increase regardless of the success of the circumstance, even if it was based upon luck or other attributes outside of the group's control (Hoogsteen, 2020; Thornton et al., 2020; Zhou, 2019).

Collective Vicarious Experience

The second source of efficacy noted by Bandura was vicarious experience. A vicarious experience is a questioned skill modeled by someone else (Goddard et al., 2004). A model is someone who the observer identifies with via various scenarios (Bandura, 1994; Goddard et al., 2004). Observing a successful person who maintains sustained efforts can help raise the beliefs of the observer as they may have similar competencies to master comparable activities (Bandura, 1994). Likewise, seeing a modeled person fail despite increased efforts can lower the perceived efficacy of the observer and their own efficiency (Bandura, 1994; Goddard et al., 2004). A model

influence is based upon the perceived similarity of the observer (Bandura, 1994). Bandura (1994) noted the amount of persuasion a model has on an observer is based upon the strength of the assumed similarity to the observer; the greater the assumed similarity, the greater the influence and persuasion a model has on an observer. Additionally, observers choose models they aspire to be like (Bandura, 1994). Experienced models can help develop the behaviors, knowledge, skills, and learned strategies of the observers (Bandura, 1994). These experiences can help an observer obtain more self-efficacy (Bandura, 1994; Goddard et al., 2004). Just as teachers have the ability for vicarious experiences through others, organizations can view successful organizations in the same light, especially those who face adversity with tenacity and consistency (Goddard, 2001; Goddard et al., 2004). Organizations do this by replicating other successful organizations (Goddard, 2001; Goddard et al., 2004). Schools, for example, do this by replicating educational programs from successful schools to achieve similar goals (Goddard, 2001).

It is common for schools to borrow ideas, structures, or educational programs from other schools successfully utilizing the borrowed resources (Zhou, 2019). As observation of successful schools continue, vicarious experience continues to grow and become strong. Bandura (1997) suggested vicarious experience can be counter to repeated personal failure if the vicarious experience provides a model for future behavior. However, it is difficult to fully grasp the totality of vicarious experience when it comes to education (Zhou, 2019). Lastly, since it can be difficult for teachers to observe other teachers in various school districts, a culture of continual peer observation can be helpful when growing vicarious experience within a school district (Hoogsteen, 2020; Thornton et al., 2020).

Collective Social Persuasion

Social persuasion, the third source, is how an individual can increase perceived self-efficacy by strengthening the belief of success through verbal persuasion of others (Bandura, 1994; Goddard et al., 2004). Goddard et al. (2004) stated the effectiveness of social persuasion depends on the trustworthiness, credibility, and ability of the persuader. People who are told they have the capabilities and skills to master a given activity are likely to increase effort and sustainability more so than if they were compelled with self-doubt and personal deficiencies (Bandura, 1994). Persuasive words help boost perceived self-efficacy, helping lead people to work hard to succeed as well as develop the sense of skills needed to become successful (Bandura, 1994). However, it is difficult to teach sustained beliefs of self-efficacy by social persuasion alone (Bandura, 1994; Goddard et al., 2004). Unrealistic persuasion can cause one to strongly reflect, personally (Bandura, 1994). For example, persuasions could cause people to fixate on negative ability or skill, thus causing them to shy away from challenges or give up quickly through adversity (Bandura, 1994; Goddard et al., 2004). Successful efficacy builders can cause others to view their scenarios in a positive manner by persuading them through constructive feedback while arranging situations that bring them success (Bandura, 1994).

Social persuasion can enhance collective efficacy by influencing the collective group through positive feedback and persuasion toward completion of a task (Goddard, 2001). When feedback occurs, information is provided to the employees about their job performance (Liu & Gumah, 2020). Employees can help establish this type of norm within their work environment and provide social persuasion,, which can be useful for success and goal achievement (Goddard, 2001; Goddard et al., 2004; Liu & Gumah,

2020). Although this happens from person to person, social persuasion, on a collective realm, can cause organizational change (Goddard, 2001; Goddard et al., 2004; Liu & Gumah, 2020). When new teachers work at a new school, they begin to understand the culture and beliefs of the school, thus understanding the norms that help cultivate an environment for success (Goddard et al., 2004). These teachers begin to learn the skills needed to become successful due to the social persuasion of the collective group (Goddard et al., 2004).

However, social persuasion can be a viable source of positive efficacy depending on the person or group who is giving feedback. Verbal persuasion depends on the credibility of the group or person and has limited potential (Hoogsteen, 2020; Zhou, 2019). Haug and Wasonga (2021) claimed verbal persuasion can have a negative effect on a person, or group. If the persuader is discredited, it could cause a negative experience and weakening of the recipient's efficacy (Haug & Wasonga, 2021). Additionally, new teachers and staff can learn how to pursue excellence in education by listening to veteran staff and teachers (Zhou, 2019). Finally, Hoogsteen (2020) stated encouraging positive collective efficacy within a school can be cultivated through social persuasion from certified and noncertified staff alike.

Collective Affective States

The last source of efficacy is collective affective states; anxiety, excitement, or the level of arousal, influences the perception of incompetence or self-capability (Bandura, 1994; Goddard et al., 2004). As people rely on their somatic and emotional states directly affecting their capabilities, some interpret stress and anxiety as vulnerability, which can lead to deficient performance (Bandura, 1994). Mood also

affects personal efficacy as people who have positive moods enrich self-efficacy while people who have negative moods demote self-efficacy (Bandura, 1994). Bandura (1994) stated the pure intensity of physical and emotional reactions is not as relevant as how they are interpreted and perceived. People with a high sense of efficacy view the level of arousal as energetic and an opportunity to succeed, while those who have low efficacy view their level of arousal as dormant (Bandura, 1994). Physiological indicators of efficacy play an imperative role in physical activity and functioning of health (Bandura, 1994).

Elevated levels of stress may cause an organization to diminish as group members lose confidence (Goddard, 2001). Organizations can remedy these sorts of problems by helping the collective group have a strong belief in the organization's values (Goddard et al., 2004). Goddard et al. (2004) explained organizations with strong beliefs and values can help group members rise to the challenge when faced with adversity. Organizations that are weaker in their beliefs and values may cause group members to lose confidence and failure may take place (Goddard et al., 2004). Affective states have a strong influence on the culture of the organization and have a direct effect on outcomes (Goddard et al., 2004).

Zhou (2019) stated schools who possess a strong group capability can have the ability to rise to various challenges and contain high tolerance. Schools react to various types of stress and challenges and those reactions help shape the affective states of the school (Haug & Wasonga, 2021; Zhou, 2019). As a school can rise to the challenge and weather high stress with strong group capability, a school can decrease in capability and capacity when dealing with challenges based upon past experiences (Zhou, 2019). Haug

and Wasonga (2021) found helping staff maintain the right amount of self-confidence can help the group have a better sense of affect state.

Certified Staff Collective Efficacy

As efficacy is defined by the belief of an individual to successfully perform a task, teacher efficacy can be viewed the same; teacher efficacy stems from the confidence a teacher obtains helping students learn (Kearney & Garfield, 2019; Lowder, 2017; Mosoge et al., 2018; Peng, 2019). Zhou (2019) stated collective efficacy stems from self-efficacy. The perception of a teacher regarding their skills and abilities correlates to the growth and engagement of students (Lu & Mustafa, 2021). Furthermore, teacher self-efficacy should be a characteristic of teachers and should be assessed in teacher preparatory systems (Lowder, 2017). Lowder (2017) noted how teacher preparatory systems should consider addressing teacher efficacy as it can help boost confidence and increase teacher retention. The belief a teacher has in their ability to teach and motivate students becomes a direct indicator of teacher efficacy (Bushey, 2019).

Teacher efficacy can influence student achievement even if the students lack motivation or the drive to succeed (Kim & Seo, 2018). If teachers can confidently use their skills, ability to teach, and capability to influence student motivation, they are able to positively impact student success (Menon & Lefteri, 2021; Engin, 2020; Kim & Seo, 2018; Thornton et al., 2020). Thornton et al. (2020) stated how critical the beliefs of teachers are, both individually and collectively, for influencing culture, success, and effective school change. Furthermore, research has shown there is a stronger relationship between teacher efficacy and student outcome than teacher efficacy and other variables of

the culture of a school (Menon & Lefteri, 2021; Engin, 2020; Kim & Seo, 2018; Thornton et al., 2020).

Enthusiasm plays a vital role in the efficacious teacher (Kearney & Garfield, 2019). Enthusiastic teachers work harder in the classroom to help struggling students, more so than teachers who are less enthused about teaching (Kearney & Garfield, 2019). Likewise, teachers with strong efficacy tend to have organizational skills and plan well (Erbas, 2021). Teachers' beliefs in their ability to teach have helped influence student achievement and cognitive engagement (Kearney & Garfield, 2019). Teacher efficacy influences the beliefs of the teacher but also affects the students' confidence in learning and their ability to learn new concepts (Erbas, 2021).

Collective efficacy beliefs can influence and change the behavior and normative environments of an organization (Goddard, 2001). Individuals in a group setting are unable to act independently without the influence of the environment around them (Bandura, 1994; Goddard, 2001). The social norms of group members are critical in understanding how the collective efficacy of the group influences individuals (Goddard, 2001). This can be seen using Bandura's social cognitive theory and his four sources of efficacy (Bandura, 1998). Social persuasion can be the source that causes change and affects collective efficacy (Goddard, 2001). If teachers in a school believe they can be successful in helping their students achieve academic success, the behavioral and normative environments will cause teachers to persevere in their educational efforts for students to achieve greater academic success (Goddard, 2001). Goddard (2001) suggested teacher collaboration can help increase collective efficacy in certified staff (Cansoy et al., 2020; Peng, 2019; Voelkel, 2019). The greater the collective teacher efficacy in a school,

the greater the impact on the behavioral and normative environments that can help the students achieve academic success (Goddard, 2001).

Noncertified Staff Collective Efficacy

Based on Goddard's (2000a) claims regarding collective teacher efficacy and its impact on the environment, one might wonder if the same holds true for noncertified staff collective efficacy. However, there is a paucity of research on collective noncertified staff efficacy in a school district (Feuerborn et al., 2018; Fortenberry, 1991). It is important to know collective noncertified self-efficacy will be viewed in the same specification as teacher self-efficacy; however, the specific self-efficacy will be viewed from the tasks, job description, and traits of the noncertified staff (Bandura, 2012). Self-efficacy is a byproduct of the structure that influences internal and external motivators for change within an organization (Bandura, 1998); moreover, this idea of self-efficacy as a byproduct for organizational change can be related to noncertified staff efficacy within a school district (Bandura, 1998). As with certified staff, noncertified staff work through similar challenges in the realm of self-efficacy and collective efficacy (Barnes et al., 2018). Finally, like teaching efficacy, the degree of confidence a noncertified school staff member has regarding job related performance, tasks, projects, and daily routines can be a direct indicator of specific self-efficacy (Bandura, 2012).

Few studies exist showing the relationship between collective efficacy and noncertified staff within a school district. Fortenberry (1991) conducted a study showing how noncertified staff viewed the culture of the school as well as how the culture impacted the perceptions of the noncertified staff. Other noncertified staff efficacy studies have predominately affirmed paraprofessionals' effect on student achievement.

Factors effecting student achievement include paraprofessional training (Brock & Anderson, 2020; Loughland & Ryan, 2022; Rosenberg et al., 2020; Wermer et al., 2018; Zobell & Hwang, 2020), professional development (Layden et al., 2018; Reddy et al., 2021), and impact on school culture (Scott et al., 2021). The researcher utilized the principles of self-efficacy and applied it to noncertified positions in a school district due to the lack of research involving noncertified staff, other than paraprofessionals, and collective efficacy (Barnes et al., 2018).

As previously noted, self-efficacy is defined as how a person feels about him/herself while performing tasks or duties (Bandura, 1997; Singh et al., 2019). According to Bandura (1997), there are three stages of self-efficacy: level, strength, and generality (Singh et al., 2019). The level stage refers to the amount of effort required to perform various tasks and those stages need degrees of teacher efficacy in order to succeed (Singh et al., 2019). Secondly, the strength stage is how robust the self-efficacy beliefs are in the individual (Singh et al., 2019). Lastly, the generality stage is the idea a person is limited to a certain task based upon the situation and for very few behaviors (Singh et al., 2019). Singh et al. (2019) stated individuals with high levels of self-efficacy can perform tasks with risk, stress, and drive. These types of self-efficacy beliefs can be utilized in noncertified staff members of schools; bus drivers, custodians, secretaries, lunch ladies, and paraprofessionals all have some form of self-efficacy and school culture can support self-efficacy within individuals (Fortenberry, 1991).

Other studies show how a positive work culture can drive self-efficacy, which is a cause for more sustainability among employees (Singh et al., 2019). Singh et al. (2019) suggested sustainability within an organization can help employees be productive as well

as value the well-being of the organization. Sustainable work practices provide balance with work and life of employees, professional development, and adequate training, thus causing employees of sustainable work environments to have job satisfaction and be committed to the organization (Singh et al., 2019). Organizational commitment is the idea a person is committed to both the job and the organization (Demir, 2020). Türker and Kahraman (2021) found a school's environment can influence whether staff want to come to work. When school staff want to come to work to be a part of the sustainable environment, they have a major impact on the school (Türker & Kahraman, 2021).

Over the past few decades, there have been many studies on the relationship between teacher efficacy and behaviors of teachers that cultivate student achievement (Bieliune, 2018; Fortenberry, 1991; Goddard, 2001; Goddard et al., 2004; MacNeil et al., 2009). Conversely, there have been few studies in understanding whether noncertified collective efficacy affects student achievement (Fortenberry, 1991). It is important to highlight how Bandura's (1994, 1998) social cognitive theory can be useful to help clarify how collective efficacy can play a vital role in student achievement (Hoy et al., 2002). Social cognitive theory is the theory of how humans have some control in their lives by making decisions based upon the observations of others (Haug & Wasonga, 2021; Hoy et al., 2002). Haug and Wasonga (2021) stated social cognitive theory puts greater prominence on human intervention that is to purposely make things happen for oneself. Through this, people can be viewed as creators of experiences or anticipators of experience rather than strictly observers (Haug & Wasonga, 2021). People can set expectations for outcomes, predict outcomes based upon experiences, and react to social standards (Haug & Wasonga, 2021). Feedback is then taken from the experiences and

one can gain a better understanding of similar future experiences (Haug & Wasonga, 2021). This is based upon Bandura's triadic reciprocal causation, which is made up of self, environmental forces, and behavior (Eells, 2011). Each of the factors shape one another continuously and will directly affect each other (Eells, 2011; Kearney & Garfield, 2019). As Eells (2011) stated:

> A person's beliefs about a specific ability (personal) will be shaped by earlier experience (behavioral) and feedback about performance (environmental), and in turn, will influence what behaviors will be tried in the future, as well as what environments will be selected. (p. 14)

The triad of factors—personal, behavioral, and environmental—will help enhance and limit efficacy in a person by learning from past experiences and obtaining expectations for similar future experiences (Eells, 2011). Through this process, school staff can have the ability to help shape student achievement and impact the culture of the school (Hoy et al., 2002). For example, Glennon et al. (2020) conducted a practice-based research study that showed school staff (school nurses, school counselors, and school psychologist) grew in self-efficacy, response, and knowledge in non-suicidal self-injury in youth. Another study showed school personnel's increase in self-efficacy and knowledge in managing food allergies and anaphylaxis (Polloni et al., 2020). Although there has been much training for school staff leading to an increase in school self-efficacy and collective efficacy, little research has been completed on how these increases can support academia as well as the culture of the school (Eaton, 2020). Past research has shown, however, there is a positive relationship between school culture and academia (Tonich, 2021).

Student Achievement

Hundreds of characteristics can influence student achievement (Donohoo, 2017). Nunes et al. (2022) suggested characteristics influencing student achievement stem from four factors —teachers, students, parents, and schools—which are all representative of the education process. Studies on various characteristics influencing student achievement include teacher content knowledge (Gess-Newsome et al., 2019), student meditation on stress and academic achievement (Valosek et al., 2021), parent-teacher relationships (Henderson, 2018), and district level initiatives (Leithwood et al., 2019). However, with so many opportunities to influence student achievement, it is important to highlight which characteristic or factor has the greatest effect on student achievement (Donohoo & Katz, 2019).

Hattie and Zierer's (2019) work *Visible Learning Insights* sought to determine what factors attributed the most to student learning. Although there were many factors involved with this data, collective efficacy held at the top of the list with an effect size of 1.57 (see Table 1).

It is important to note this table shows results from teacher collective efficacy. Efficacy beliefs help pilot the behaviors and actions of the individuals at school (Donohoo, 2017). As collective efficacy develops in a school district, student achievement may be an attainable outcome (Donohoo, 2017).

Table 1

Factors Influencing Student Achievement and Their Effect Size

Influencer	Effect Size
Collective teacher efficacy	1.57
Self-reported grades/student expectations	1.44
Teacher clarity	0.75
Feedback	0.75
Teacher-student relationship	0.72
Metacognitive strategies	0.69
Prior achievement	0.65
Phonics instruction	0.54
Socioeconomic status	0.52
Home environment	0.52
Play programs	0.50
Parental involvement	0.49
Motivation	0.48
Concentration/persistent/engagement	0.43
School Size	0.40
Mathematics programs	0.39
School leadership	0.39
Homework	0.29

Note. From *Collective Efficacy: How Educators' Beliefs Impact Student Learning* by J. Donohoo, 2017. Corwin: A SAGE Company.
This table only shows results derived from teacher collective efficacy. From *Collective Efficacy: How Educators' Beliefs Impact Student Learning*

Collective Efficacy and Student Achievement

The impact of staff efficacy in a school district has shown to have a positive correlation throughout many areas such as classroom management, resiliency, student achievement, and focus on instruction (Weaver, 2015). With an average effect size of 1.39, one study showed collective teacher efficacy has a strong correlation to student achievement utilizing a Cohen's d (Fisher et al., 2020; Hattie & Zierer, 2019). Furthermore, Donohoo et al. (2018) demonstrated collective teacher efficacy had an effect size of 1.57 utilizing Cohen's d. School staff efficacy can also have influence on

parental involvement and assist students from various backgrounds (Weaver, 2015). Staff efficacy can have a pivotal influence on a school and achievement of students (Donohoo et al., 2018; Weaver, 2015). Donohoo found students are more successful in math and English with high collective staff efficacy. As school organizations continue to strive to improve culture, the impact of positive culture on staff members can help drive collective staff efficacy (Fortenberry, 1991). It is important to note with multiple studies on how collective efficacy of teachers provide a positive influence on student learning (Fisher et al., 2020; Goddard, 2001; Hattie & Zierer, 2019), there is a gap in research examining the influence of noncertified collective staff efficacy and student achievement. One might assume, based upon teacher collective efficacy, that noncertified collective efficacy would have similar effects on student achievement as teacher collective efficacy. The assumption warrants further investigation and prompted the purpose for this study.

Goddard et al. (2000b) noted a relationship between high collective teacher efficacy and student achievement. The results of their study showed students grew 40% in math and reading if the collective staff efficacy score raised one unit (Goddard et al., 2000b). Additionally, Cunningham and Farmer (2016) stated teacher perception of collective staff efficacy and intrinsic motivation had significant impact on student motivation. Furthermore, teacher intrinsic motivation has had the most significant impact on student learning due to the confidence held by the teacher and the motivation to control the classroom (Cunningham & Farmer, 2016). Teachers' expectations increase as teachers believe in their abilities to instruct students, which helps students become motivated to learn (Cunningham & Farmer, 2016).

Achieving collective efficacy within a school can be a challenge, however, it is imperative for teachers to understand the difference they make in education by working together to teach and provide a positive learning environment (Haug & Wasonga, 2021). When the actions of a school result in a positive experience, these results continue to foster future collective efficacy and strengthen the school collectively (Haug & Wasonga, 2021). As a school continues to develop academic achievement via collective efficacy, teachers and staff think of their work and goal for student success as the norm of the school (Haug & Wasonga, 2021). This continued cycle for student academic achievement and improvement can cause school decisions, levels of self-efficacy among staff, and collective efforts to rise (Haug & Wasonga, 2021). Eells (2011) stated collective efficacy was one of the biggest factors in fostering student achievement.

Meyer et al. (2020) noted a school's collective efficacy can be motivational resulting from teachers' subjective perspectives of their comprehensive level of pedagogy effectiveness. Student achievement is influenced by the various styles of productive teaching methods through collective efficacy (Donohoo, 2018; Hoogsteen, 2020). Additionally, collective efficacy is the teachers' ability to utilize their resources and deal with challenges while continuing to produce and cultivate a positive learning environment (Meyer et al., 2020). Capone et al. (2018) stated collective efficacy correlates with the social well-being of a student which would, in turn, aid in student achievement. When teachers share the belief they can make an impact on student achievement, it outranks various other factors that increase student achievement (Donohoo, 2017).

Collective efficacy has a large rippling effect on many other aspects in education (Donohoo & Katz., 2019; Powell & Gibbs, 2018; Strahan née Brown et al., 2019). Collective efficacy can affect the culture of the school and cause school staff to expect student success as well as share language (Donohoo & Katz, 2019). Donohoo and Katz (2019) suggested a school with high collective efficacy focuses on student learning rather than instructional compliance. Additionally, teachers and staff will believe their central task is to evaluate the effectiveness of lessons and student outcomes as they continue to increase in collective efficacy (Donohoo & Katz, 2019). It was also found that teachers and school staff recognize student success or failures as more indicative of what the teachers or school staff have completed or not completed, and they will learn to work together to solve problems (Donohoo & Katz, 2019). It would be important for schools to strive to build collective efficacy in order to, potentially, assist with student achievement (Bozkurt et al., 2021; Donohoo & Katz, 2019). Bozkurt et al. (2021) highlighted that school climate and group communication are imperative in the scope of developing collective efficacy within a school.

School Size

According to Brown and Earthman (2019), per district, the average number of school buildings has decreased since the 1940s; meanwhile, there has been a steady increase in student population across the United States since the 1980s. As schools are increasing in student population, educational leadership continues to face challenges in achieving student success (Brown & Earthman., 2019). Furthermore, there has been much debate and research in analyzing how, and if, school size affects student achievement (Brown & Earthman, 2019; Busby et al., 2020; Giambona & Porcu, 2018;

Masci et al., 2018). Researchers have found class size, school size, and teacher-student ratios influence student achievement (Busby et al., 2020; Giambona & Porcu, 2018; Masci et al., 2018). Masci et al. (2018) suggested smaller class size has a positive effect on student success. Conversely, Brown and Earthman (2019) conducted a study and suggested student achievement, along with socioeconomic status, are not indicative of the size of the high school rather in the school. Brown and Earthman also found a significant relationship between minority status, student attendance, socioeconomic status, and student achievement.

Furthermore, other studies also show class size and student achievement are directly related (Salgado et al., 2018). For example, one study demonstrated an urban middle school showed an increase in test scores and student achievement based upon the class size (Salgado et al., 2018). Another challenge in school size is the cost involved with expanding and increasing classrooms (Filges et al., 2018). Studies suggest cost can play a part in decreasing class sizes in schools, thereby causing further challenges in providing students with a positive educational environment (Filges et al., 2018).

Summary

Higher teacher efficacy can assist in raising student achievement (Bieliune, 2018; Fortenberry, 1991; MacNeil et al., 2009; Salloum, 2022). Collective efficacy within a school district can bring change in the culture and support student achievement (Goddard, 2001; Goddard et al., 2004). Efficacy can be learned through training and understanding the sources of self-efficacy (Bandura, 1994). Studies have shown a positive relationship between collective teacher efficacy and student success (Bieliune, 2018; Goddard, 2001; Goddard et al., 2004; MacNeil et al., 2009), however, the researcher noted a gap in

literature regarding collective noncertified staff efficacy (Fortenberry, 1991). This study sought to fill the gap in literature of the relationship between collective noncertified staff efficacy and student achievement. This quantitative correlational study focused on the relationship between certified and noncertified collective staff efficacy and ACT scores of Missouri high school students. The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri Public high school students' ACT scores.

The purpose of this study was to examine the relationship between collective efficacy of certified and noncertified staff utilizing Goddard et al.'s (2000a) Collective Efficacy Scale and Missouri high school ACT scores. This study also examined how school size influences collective efficacy within a school. Chapter Two contained a background of the topics in the research questions.

Chapter Three will contain the methodology for this study including the sampling, research design, instrumentation, data collection, and data analysis. Chapter Four will contain the results of the study. In Chapter Five, the researcher will summarize findings and make recommendations for future research.

Chapter Three

Methodology

Introduction

This quantitative dissertation study attempted to measure the relationship between collective efficacy of certified and noncertified staff and Missouri high school ACT scores. Goddard et al.'s (2000a) Collective Efficacy Scale was used as the survey to measure certified and noncertified collective staff efficacy. Additionally, Goddard et al.'s (2000a) Collective Efficacy Scale was revised to survey noncertified staff, specifically. Participants for this study were from rural, urban, and suburban Missouri high schools. Each school surveyed was a member of DESE. Additionally, the discussion of the participants, selection process, research design, and instrumentation will be presented throughout this chapter. Furthermore, a brief examination of the data analysis will be included in this chapter. Lastly, a summary of the research and methodology will conclude Chapter Three.

Problem and Purpose of the Study

As school culture continues to transform with each generation of students and staff, it is imperative that school administrators understand the importance of cultivating a positive learning environment for employees and students. Past studies have shown that a positive school culture promotes growth for both staff and students (Bieliune, 2018; Fortenberry, 1991; MacNeil et al., 2009), therefore, it is essential that school leadership understands and adapts to cultivating a positive culture enhancing collective staff efficacy (Çalik et al., 2012). Additionally, there is a lack of research in examining the relationship

between collective efficacy of noncertified staff and student achievement (Fortenberry, 1991). The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri public high school students' ACT scores. Furthermore, it would be beneficial for future educational leaders to gain insight into collective noncertified staff efficacy and how that may relate to building culture and, as a result, student achievement.

Research Questions

RQ1: What is the predictive relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores?

RQ1a: What is the predictive relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in 2019-2020 school year?

RQ1b: What is the predictive relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year?

Hypotheses

In an effort to answer the aforementioned research questions, the following null hypotheses were investigated:

$H_0$1: There will be no statistically significant relationship between collective staff

efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores.

$H_0$1a: There will be no statistically significant relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in 2019-2020 school year.

$H_0$1b: There will be no statistically significant relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test score in 2019-2020 school year.

Selection/Sampling

Data were collected from 510 schools across the state of Missouri including ACT scores from the 2019-2020 school year. Participants for this study included both certified and noncertified staff at Missouri high schools. Each staff member was given a survey and was asked various questions regarding collective efficacy in their schools. Only members of DESE public high school s in the state of Missouri were selected for this study. Schools surveyed were located throughout the state of Missouri. The superintendent or designee of identified districts were asked to participate in the study by forwarding the link to the survey to the high school certified and noncertified staff. Once the superintendent, or designee, agreed to the study (see Appendix A), both noncertified and certified staff were able to complete the survey (see Appendices B and C). Each building administrator was given one week to respond to the email requesting for the survey to be distributed in the district. Once the survey was distributed, noncertified and

certified staff had one week to complete the survey. A follow-up email was sent to the district that did not respond as well as to the noncertified and certified staff to complete the survey. School selection was limited to a Missouri public school in Missouri Department of Elementary and Secondary Education (DESE).

ACT scores were gathered from DESE and each score correlated with each school that provided survey feedback in order to show a relationship between collective efficacy and ACT scores. Additionally, the researcher gathered school size data from DESE in order to help answer research questions. Both sets of data were used to help answer the research questions and guide the study.

Research Design

The purpose of this quantitative, correlational study was followed up with a multiple regression to examine the relationship between collective efficacy of certified and noncertified staff using Goddard et al.'s (2000a) Collective Efficacy Scale with Missouri high school ACT scores. The relationship correlational design determined any significant relationship between the relationship between collective noncertified staff efficacy and school size, the relationship between collective certified staff efficacy and school size, the relationship between collective noncertified staff efficacy and Missouri high school ACT scores from 2019-2020 school years, and the relationship between collective certified staff efficacy and Missouri high school scores from the 2019-2020 school year. The researcher was able to obtain the ACT data and school size from DESE for the 2019-2020 school year.

By using a quantitative study, the researcher was able to utilize Goddard et al.'s (2000a) Collective Efficacy Scale survey to ask various questions using a Likert scale;

furthermore, the researcher used Goddard et al.'s (2000a) Collective Efficacy Scale and revised the questions to help survey noncertified staff members of each school. The researcher found using a quantitative study design was appropriate due to each survey was calculated with the total score via a Likert scale (Ewing & Park, 2020). As Ewing and Park (2020) stated, a Likert scale can be viewed as a ratio measurement as it determines the existence of a variable being measured. Additionally, the researcher was able to examine ACT data from the DESE. Since all the information gathered was from the surveys and DESE, the researcher used a quantitative multiple regression study to measure collective efficacy of both certified and noncertified staff and Missouri High School ACT scores.

This nonexperimental study helped the researcher examine the predictive relationship between certified and noncertified collective efficacy and the linear combination of school size and Missouri ACT scores (Jhangiani et al., 2019). Nonexperimental research is when the researcher does not deliberately manipulate any variable of the study and the entirety of the study occurs naturally (Radhakrishnan, 2013). Throughout this study, the researcher did not manipulate any variable that would cause non-natural results to occur. The researcher gathered data through variables when they naturally occurred in various school districts (Jhangiani et al., 2019). Due to the number of variables within the study, the researcher utilized a principal component analysis and a multiple regression analysis of the research data. Each method was utilized in order to answer the research questions thoroughly.

The research question involved a correlation design to show the relationship between the collective efficacy of certified and noncertified staff and Missouri ACT

scores. Pearson's *r* was used to assess the relationships between certified and noncertified collective efficacy using Goddard et al.'s (2000a) Collective Efficacy Scale and Missouri high school ACT scores. Goddard et al.'s (2000a) Collective Efficacy Scale was based upon a Likert scale ranging from 1 to 6; with 1 meaning *strongly disagree*, 2 meaning *disagree*, 3 meaning *slightly disagree*, 4 meaning *slightly agree*, 5 meaning *agree*, and 6 meaning *strongly agree*. The Likert scales were calculated by adding all the scores from each of the items with some of the items needing to be reversed scored. Each overall score ranged from 21-126, with the understanding the greater the overall sum, the higher collective efficacy. Two separate Likert scales were utilized, one for certified staff and one for noncertified staff, as the questions were tailored toward collective certified staff efficacy and collective noncertified staff efficacy. The researcher chose a correlational design to help answer if there was a relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores . Lastly, a multiple regression was used to predict noncertified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale from a linear combination of school size and ACT test scores in the 2019-2020 school year; additionally, a second multiple regression was used to predict the certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale from a linear combination of school size and ACT test scores in the 2019-2020 school year.

Instrumentation

After receiving permission from the author (see Appendix D) , the researcher used Goddard et al.'s (2000b) Collective Efficacy Scale to measure the perceived collective

efficacy of certified staff in the surveyed school districts. The questions from Goddard et al.'s (2000b) Collective Efficacy Scale were tailored to staff that were certified in a school district, mainly teachers and administration. Participants were measured based upon a 21-item scale. Each question was based upon a Likert scale from 1 to 6; however, 10 of the items were scored based upon a reversed Likert scale. A 6 on the Likert scale meant the participant strongly agreed with the statements; conversely, a participant's a score of 1 meant the participant strongly disagreed with the statement. Total scoring was a compilation of all the numbered responses to the statements that would vary from 21 to 126, with the understanding of the greater the sum, the higher the collective efficacy. The total time to take the survey was roughly 15 minutes. Questions were asked to gauge and measure overall collective efficacy of certified staff in school districts. Lastly the researcher gave each participant one week to complete the survey.

The researcher chose Goddard et al.'s (2000a) Collective Efficacy Scale as the instrument to measure collective efficacy of certified staff. The development of Goddard et al.'s (2000a) Collective Efficacy Scale had several phases (Goddard et al., 2000b). The initial scale was modified from Gibson and Dembo's (1984) Teacher Efficacy Scale to reflect collective efficacy (Goddard et al., 2000b). Next, a panel was constructed of experienced teacher efficacy experts to write additional items to the scale (Goddard et al., 2000b). A pilot test was completed using 46 teachers in 46 schools with the results suggesting that the 21 items did indeed offer a reliable and valid measure of collective efficacy (Goddard et al., 2000b).

In order to check for criterion-related validity of the collective efficacy scale, Goddard et al. (2000b) observed the relationship between collective teacher efficacy and

conflict, trust in colleagues, sense of powerlessness, and individual efficacy. To do this, Goddard et al. (2000b) gave the pilot group three other scales: an individual teacher efficacy scale (Bandura, 2012), a sense of powerlessness scale (Zielinski & Hoy, 1983), and a measure of teacher trust in colleagues (Hoy & Kuppersmith, 1985; Hoy & Sabo, 1998). These scales were used to help validity check of efficacy measure (Goddard et al., 2000b). As predicted, there was a significant and positive correlation between collective efficacy and trust in teachers ($r = .67$, $p < .001$), and collective efficacy and teacher efficacy ($r = .41$, $p < .001$); there was a significant and negative correlation between collective teacher efficacy and teacher powerlessness ($r = -.51$, $p < .001$).

After the pilot was completed, Goddard et al. (2000b) tested the scale on a more comprehensive sample in order to, possibly, find some predictions of about collective teacher efficacy and student achievement. A total of 452 teachers from 47 elementary schools located in one large urban midwestern school district was surveyed using the scale (Goddard et al., 2000b). Similarly, as with the pilot, Goddard et al. (2000b) had each teacher complete the collective efficacy scale and three other tests in order to perform further checks for criterion validity for the Collective Efficacy Scale. These scales were personal teacher efficacy (Hoy & Woolfolk, 1993), environmental press (Hoy & Sabo, 1998), and faculty trust in colleagues (Hoy & Kuppersmith, 1985). Goddard et al. (2000b) found there was a moderate and positive correlation between collective teacher efficacy and teacher efficacy aggregated at the school level ($r = .54$, $p < .01$). Comparably to the pilot, Goddard et al. (2000b) found trust in colleagues was significantly and positively related to collective teacher efficacy ($r = .62$, $p < .01$). Lastly, Goddard et al. (2000b) found collective teacher efficacy was not significant to

environmental press (r = .05, *n.s.*).

According to Laerd Statistics (2018b), when a given expected construct can correlate with other constructs as positive, negative, or with no relation, construct validity may be established (Goddard et al., 2000b). By utilizing the pilot and comprehensive study, Goddard et al. (2000b) were able to correlate tests in order to establish construct validity. Goddard et al. (2000b) found, as predicted, in both the pilot and full study, their measure of collective efficacy scale was positively related to Bandura's (2012) measure of teacher efficacy, personal teacher efficacy assessed using Hoy and Woolfolk's (1993) adaptation of a set of Gibson and Dembo (1984) items, and faculty trust in colleagues. Furthermore, collective efficacy was unrelated to environmental press, and was negatively correlated to teacher powerlessness. The results helped show the collective efficacy scale was valid. The measure has a high internal reliability of alpha = .96. Lastly, according to Goddard et al. (2000b),

> Teacher responses were submitted to a principal axis factor analysis with a varimax rotation. Two factors emerged from the collective efficacy items (eigenvalues of 7.53 and 1.96) that explained a total of 63.2% of the variance in the collective teacher efficacy items. Close inspection of the factor loadings revealed that, with one expectation, the items loading on Factors 1 and 2 reflected the group competence and task analysis dimensions of collective efficacy, respectively. (p. 489)

Even though two factors were identified, the researcher combined the two factors into one continuous result due to the dependent variable, Missouri ACT scores, which needed to be continuous for the multiple regression.

As Goddard et al.'s (2000a) Collective Efficacy Scale was given to teachers, the researcher developed a similar survey as a pilot for noncertified staff. The researcher asked Dr. Robert Goddard for permission to revise Goddard et al.'s (2000a) Collective Efficacy Scale in order to better fit surveying noncertified staff to complete the survey. The researcher utilized a panel of experts, which consisted of one superintendent, one noncertified staff, one administrator, and two professors. This panel read through the tailored noncertified questions and rated whether each question adequately represented the content for collective noncertified staff efficacy. After the field test was completed, the researcher calculated the average score for each construct for reliability. If the researcher found the question's average score was not at least 0.7, the researcher revised the questions and had the panel re-evaluate the questions again. The researcher then re-calculated the question's average scores. Once all question averages were at least a 0.7, the researcher was able to administer the pilot. The researcher then gave the revised field test questions to the pilot group consisting of at least 30 noncertified staff members at the researcher's district as they were not included in the actual study due to minimizing researcher bias. Data were compiled, and Cronbach's alpha was calculated in order to find any adjustments needing to be made before moving forward with the research. The data were analyzed using principal component analysis in order to find the number of constructs. Since the researcher revised a previous survey to gauge collective efficacy, a principal component analysis was necessary to find if the revised survey measured collective efficacy of noncertified staff for each question (Laerd Statistics, 2018b).

There are assumptions needed to run a principal component analysis. The first assumption was the researcher had multiple variables that were measured at the

continuous level using a Likert scale for each question of the survey. The second assumption of a principal component analysis is there is a linear relation between the variables. The researcher tested a few variables to determine the linear relation. The next assumption is sample adequacy, in which the sample size the researcher used was at least 30 participants in the pilot study. Lastly, the researcher found no significant outliers and the overall data could be suitable for reduction. The researcher found adequate correlations between the data, which helped ensure the data to be suitable for reduction (Laerd Statistics, 2018b).

Next, the researcher inspected the extraction of components and determined the meaningful components to retain for this study. A revised total variance was explained, and a rotated components matrix was interpreted with the data. Lastly, after total variance was explained and the rotated components matrix interpreted, the researcher was able to assign a score for each component for each participant. The researcher also calculated Cronbach's alpha for each construct for reliability. Cronbach's alpha is used to measure internal consistency on several variables (Laerd Statistics, 2018b); since the researcher used the pilot to measure the underlying construct of collective efficacy of noncertified staff, it was important for the researcher to calculate the Cronbach's alpha for each construct in order to ensure internal consistency, and reliability, with each survey question. These scores were used for further investigation using a multiple regression model (Laerd Statistics, 2018b).

Data Analysis

The data were collected from all the Missouri high schools' certified and noncertified staff who participated in completing the survey. There were two surveys the

researcher gave to participants: Goddard et al.'s (2000a) Collective Efficacy Scale, which was given to all certified staff, and a revision of Goddard et al.'s (2000a) Collective Efficacy Scale in order to better fit noncertified staff. After the data were collected from each survey, the researcher reported the frequency, mean, and the range for each of the data sets. Each of the data sets were inputted in Statistical Package for Social Science (SPSS). All of the data were exported into an Excel document and data cleanup was completed by checking to find any missing data from the surveys or any duplicates. Any incomplete category was altered in order to run the analysis. Descriptive data were calculated, which helped break down each set of data for easier interpretation.

After permission for use from Dr. Robert Goddard, the researcher used Goddard et al.'s (2000b) Collective Efficacy Scale, which was found to be valid and reliable. According to Goddard et al. (2000b), there was a positive relationship between school level teacher efficacy and collective efficacy ($r = .54$, $p < .01$); additionally, there was a positive relationship between trust in colleagues and collective efficacy ($r = .62$, $p < .01$). The researcher then asked for permission from Dr. Robert Goddard to revise the original collective efficacy scale in order to better fit noncertified collective efficacy. After permission was granted, the researcher developed a pilot survey given to at least 30 noncertified staff members. The researcher needed to determine the reliability and validity of the noncertified instrument in order to proceed with the study. In order to determine whether the data would be appropriate, at least a 0.7 Cronbach's alpha was needed in order to show reliability and validity of the noncertified collective efficacy survey. Next, a multiple regression was conducted in order to see if the dependent variable, which was the linear combination between school size and Missouri ACT

scores, was indicative of, if any, the independent variables: collective efficacy of noncertified staff, and collective efficacy of certified staff.

There are eight assumptions needed to run a multiple regression. First, the researcher determined the continuous dependent variable for this study would be the linear combination of school size and Missouri ACT test scores. Missouri ACT test scores and school size would both be continuous variables based upon the test performance of ACT scores and varied school size (Laerd Statistics, 2018a). Second, two or more continuous independent variables were also needed to run a multiple regression. For this study, the continuous independent variables were the overall collective efficacy scores of certified staff measured by Goddard et al.'s (2000a) Collective Efficacy Scale, and the overall collective efficacy noncertified scores measured by the pilot scale for noncertified staff. For the next assumption, the researcher ran the Durbin-Watson test, which confirmed the independence of observations.

The next assumption needed was that the independent variables are collectively related linearly to the dependent variables as well as each independent variables are linearly related to the dependent variable. For this study, the researcher used scatterplots and partial regression plots to ensure the dependent variable had a linear relationship to the collective independent variables as well as to each independent variable. Next, the researcher showed homoscedasticity of residuals by plotting the studentized residuals against the unstandardized predicted values. The researcher then calculated multicollinearity, which is measuring the relationship between the two independent variables. The researcher tested multicollinearity using Tolerance and VIF in order to confirm the data meets this assumption (Laerd Statistics, 2018a).

The last two assumptions in multiple regression are checking for unusual points and checking the residuals are approximately normally distributed. The researcher used Casewise Diagnostics and studentized deleted residuals in order to determine any outliers, high leverage points, or highly influential points in the study. Lastly, to check that the residuals were approximately normally distributed, the researcher used a P-P Plot and a histogram with superimposed normal curve in order to determine normal distribution (Laerd Statistics, 2018b).

After running the multiple regression, the researcher used tables in order to determine whether the multiple regression model was a good fit for the data. The researcher used the model summary and an ANOVA table in order to evaluate the data. Within the model summary, the researcher interpreted the *R*-Square, Adjusted *R*-Square, and Durbin-Watson. By using the ANOVA table, the researcher was able to interpret the statistical significance of the overall model, where $p < .05$, as well as interpret *F*-statistics.

After interpreting the overall model fit and the ANOVA table, the researcher evaluated the coefficients in order to understand if there was a linear relationship between the dependent and independent variables. The researcher interpreted the slope coefficients for each continuous independent variable and interpreted the *p-v*alue for each continuous independent variable. Additionally, the researcher was able to use the regression equation to calculate predicted values. Lastly, the researcher was then able to make predictions of the dependent variables based upon the values of the independent variables of this study.

Summary

The purpose of this study was to examine the relationship between collective efficacy of certified and noncertified staff utilizing Goddard et al.'s (2000a) Collective Efficacy Scale and Missouri high school ACT scores. This study also examined how school size influences collective efficacy within a school. The methodology of this study including the design, instrumentation, participants, and analysis were briefly explained. Chapter Four will contain the results of the study. In Chapter Five, the researcher will summarize findings and make recommendations for future research.

Chapter Four

Analysis of the Data

Introduction

Collective efficacy can be important for student success within a school district (Goddard et al., 2004). Past research has shown the significance of teacher efficacy and student achievement (Bieliune, 2018; Fortenberry, 1991; Goddard, 2001; Goddard et al., 2004; MacNeil et al., 2009; Salloum, 2022). Teacher efficacy can be achieved through proper and continuous training, which can help increase collective staff efficacy within a school (Bandura, 1994; Lowder, 2017). Furthermore, having strong collective efficacy can help establish the norms and climate of a school by encouraging staff to continue to pursue excellence in student achievement (Goddard, 2001; Goddard et al., 2004).

Many studies have shown the relationship between the collective efficacy of certified staff and student performance (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). These studies have helped shape the collective efficacy of certified staff and the impact collective efficacy has on a school district. Although there has been much research in certified staff efficacy, there is a gap in current literature regarding the noncertified collective staff efficacy within a school district (Fortenberry, 1991; Goddard et al., 2004). Since Bandura (1994) noted collective efficacy can impact organizations, one may wonder about the potential influence of collective efficacy of noncertified staff at a school district. Additionally, more research into noncertified collective staff efficacy can help gain further insight into

how the joint collective certified staff and noncertified collective efficacy relate to student achievement.

The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri Public High School students' ACT scores. Results will help contribute to the understanding of collective efficacy in both certified and noncertified staff within a building, and as a result the building culture and student achievement. Chapter Four will present the research findings related to each research question and null hypothesis of the study, the pilot analysis, the demographic data, and data cleanup.

Research Questions

This study attempted to answer the following research questions:

RQ1: What is the predictive relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores?

RQ1a: What is the predictive relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in 2019-2020 school year?

RQ1b: What is the predictive relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year?

Null Hypotheses

In an effort to answer the aforementioned research questions, the following null hypotheses were investigated:

$H_0$1: There will be no statistically significant relationship between collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores.

$H_0$1a: There will be no statistically significant relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in 2019-2020 school year.

$H_0$1b: There will be no statistically significant relationship between noncertified collective staff efficacy as measured by the revised Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test score in 2019-2020 school year.

Pilot

As Goddard et al.'s (2000a) Collective Efficacy Scale was given to certified staff at school districts, the researcher developed a similar survey as a pilot for noncertified staff. After receiving permission from Dr. Goddard, the researcher sought to revise Goddard et al.'s (2000a) Collective Efficacy Scale to better fit surveying noncertified staff. The researcher utilized a panel of experts, which consisted of two professors, one administrator, one superintendent, and one noncertified staff. The panel read through the revised noncertified collective efficacy survey and rated whether each question adequately represented the content for noncertified collective staff efficacy. After

completion of the field test, the researcher calculated the average score for each construct for reliability. The researcher was seeking a score of .70 for all of the revised questions. If a question did not score a .70, the researcher revised the questions and had the panel reevaluate the questions. Once all of the questions scored a .70, the researcher was able to administer the pilot.

The researcher gave the 21-question revised questionnaire, which measured collective efficacy of noncertified staff, to a pilot group comprised of 34 noncertified staff members. Theses noncertified staff members included bus drivers, paraprofessionals, secretaries, technology personnel, food services, and custodians. To minimize researcher bias within the current study, the pilot group was from the researcher's district as its members were not included in the actual study. Additionally, this allowed the researcher to ask and answer clarifying questions to improve the instrument. After the data were compiled, Cronbach's alpha was calculated in order to find any adjustments needing to be made prior to moving forward with the research. Data were analyzed using a principal component analysis (PCA) in order to find the number of constructs. Since the researcher revised a previous survey to assess collective efficacy of noncertified staff, a PCA was necessary to find if the revised survey measured collective efficacy of noncertified staff for each question (Laerd Statistics, 2018b).

Principal Component Analysis

A PCA is a variable-reduction technique that aims to lower the larger set of variables into a smaller set called principal components, which represent most of the variance in the data (Laerd Statistics, 2018b). Researchers run a PCA when seeking to reduce the dimensionality of large datasets; when there are multiple variables in a dataset,

researchers run a PCA in order to help observe trends, outliers, and clusters (Laerd Statistics, 2018b). Due to the multiple variables in this study, the researcher assessed the appropriateness of PCA prior to analysis. There are four assumptions to review prior to running a PCA in order to determine appropriateness: the researcher has multiple variables measuring at a continuous level, there is a linear relationship between all variables, there are no outliers and data are suitable for reduction, and there must be a large sample size to adequately produce a reliable result.

In order to satisfy the first assumption, an examination of the correlational matrix was needed to examine if any variables were not strongly correlated with any other variable (Laerd Statistics, 2018b). Researchers examine the correlational matrix to search for any variable(s) that are not correlated to other variables with a value greater than .30. Any variable(s) that do not have any correlations above r = .30 should be removed. For this study, the correlational matrix showed one variable that did not have at least one correlation with the coefficient greater than .30; however, all other variables had at least one correlation coefficient greater than .30. The researcher removed the variable that did not have at least one correlation greater than .30. After removing the variable with no correlation, the researcher was able to test the assumption of sampling adequacy.

Next, in order to test the assumption of sampling adequacy, or the linear relationship between the variables, researchers use the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy for the overall data set. Values for the KMO range 0 to 1, with the minimum requirement for adequacy being at least .60 while values over .80 are considered good and indicative of the use of PCA (Laerd Statistics, 2018b). Furthermore, the researcher examined the Anti-Image Matrices, which showed the individual KMO

scores for each variable. The researcher found one variable with a low KMO score of .45. Individual KMO scores less than 5 should be considered for removal (Laerd Statistics, 2018b). After removing the variable with the low KMO score, the researcher ran the analysis again and found the overall Kaiser-Meyer-Olkin (KMO) measure of this study was .67 with individual KMO measures all greater than .50, classifications of "Miserable" to "Meritorious" according to Kaiser (1974).

Additionally, a Bartlett's test of sphericity was examined in order to see if the data were suitable for reduction (Laerd Statistics, 2018b). Bartlett's test of sphericity tests the null hypothesis that the correlational matrix is an identity matrix (Laerd Statistics, 2018b). An identity matrix shows 0's in the off-diagonal elements while showing 1s on the diagonal elements (Laerd Statistics, 2018b). Essentially, the identity matrix sought to show no correlations between the variables (Laerd Statistics, 2018b). Showing no correlations between the variables was important when running a PCA as the researcher was seeking to reduce the number of variables into smaller components (Laerd Statistics, 2018b). For this study, Bartlett's test of sphericity was statistically significant ($p < .001$), indicating that the data were likely factorizable (see Table 1). With Bartlett's test of sphericity being statistically significant, the researcher assumed data were suitable for reduction (Laerd Statistics, 2018b).

Table 1

Results From a Kaiser-Meyer-Olkin (KMO) Measure of Noncertified Collective Efficacy Questionnaire

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.67
Bartlett's Test of Sphericity	Approx. Chi-Square	375.76
	df	171
	Sig.	<.001

After the assumptions were satisfied, the researcher ran a PCA of the data. A PCA is used to assist in breaking down the data into smaller sections called components. Furthermore, when running a PCA, the researcher uses an eigenvalue-one criterion, also called the Kaiser criterion, in order to establish how many components to retain after the analysis (Laerd Statistics, 2018b). An eigenvalue less than 1 implies the component represents less variance and that variable should not be retained (Laerd Statistics, 2018b). For this study, the PCA revealed four components that had eigenvalues greater than 1, which represented 32.11%, 13.17%, 11.90%, and 9.92% of the total variance, respectively (see Table 2).

Table 2

Total Variance Explained for Noncertified Collective Efficacy Questionnaire

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	Total	% of Variance	Cumulative%	Total	% of Variance	Cumulative %	Total
1	6.10	32.11	32.11	6.10	32.11	32.11	4.32
2	2.50	13d.17	45.28	2.50	13.17	45.28	4.32
3	2.26	11.90	57.18	2.26	11.90	57.18	3.24
4	1.89	9.92	67.10	1.89	9.92	67.10	2.50
5	1.10	5.78	72.88				
6	0.98	5.17	78.05				
7	0.81	4.25	82.30				
8	0.63	3.33	85.63				
9	0.54	2.86	88.49				
10	0.51	2.68	91.16				
11	0.38	1.98	93.14				
12	0.30	1.59	94.73				
13	0.25	1.34	96.07				
14	0.20	1.03	97.09				
15	0.17	0.89	97.98				
16	0.14	0.72	98.70				
17	0.13	0.69	99.39				
18	0.08	0.42	99.81				
19	0.04	0.19	100.000				

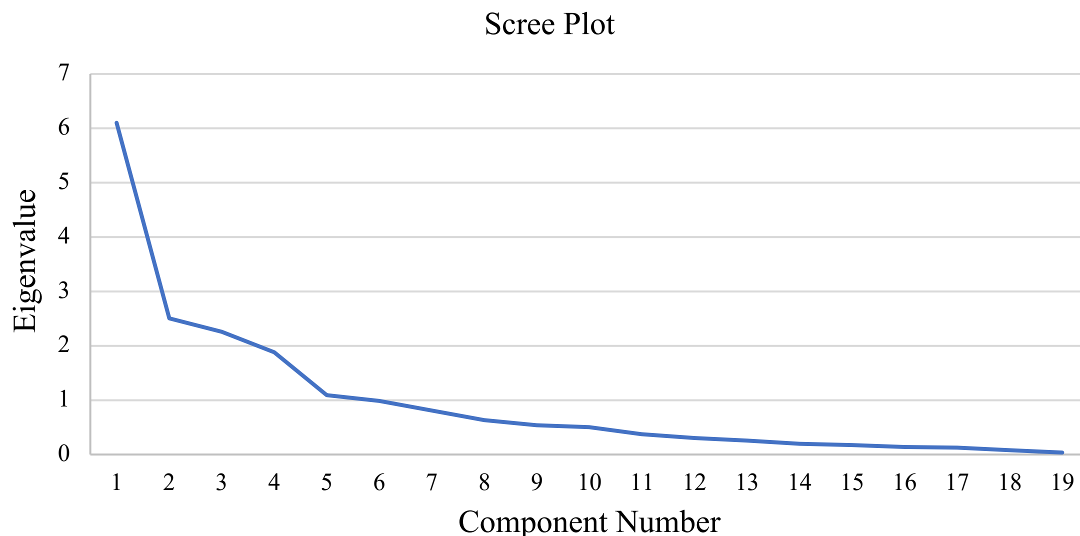
Note. Extraction Method: Principal Component Analysis. The first four components were examined.
[a] When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Next the researcher examined a scree plot. A scree plot shows the total variance explained by each component (Laerd Statistics, 2018b). The components retained were the ones before the inflection point on the graph (see Figure 1). The inflection point represents where the graph levels out and ensuing points add little to the total variance (Laerd Statistics, 2018b). Visual inspection of the scree plot (see Figure 1) indicated that four components should be retained (Cattell, 1966). In addition, a four-component

solution met the criteria for interpretability. As such, four components were retained: the opportunities in this community help ensure that these students will learn, noncertified school staff here don't have the skills needed to assist in producing meaningful student learning, noncertified school staff here don't have the skills, and the lack of supplies in this school makes assisting in student learning very difficult.

Figure 1

Scree Plot of Principal Component Analysis



The four-component solution represented 67.10% of the total variance. There are various rotations a researcher may use to help influence how components may load components (Laerd Statistics, 2018b). The researcher was seeking a "simple structure," which shows an understandable division of variables on distinct components (Laerd Statistics, 2018b). A Varimax orthogonal rotation is one way to show a simple structure. A Varimax orthogonal rotation was employed to aid interpretability. The rotated solution did not exhibit a 'simple structure' (Thurstone, 1947) so the researcher used a different rotation called Direct Oblimin to aid interpretability (see Table 3). A Direct Oblivion,

which is an oblique transformation, assisted the researcher by providing a more ‘simple structure’ (Laerd Statistics, 2018a). However, the Direct Oblimin showed components loading onto different variables (Laerd Statistics, 2018a). The interpretation of the data was not consistent with the original constructs in Goddard et al.’s (2000a) Collective Efficacy Scale tailored to noncertified staff.

Table 3

Direct Oblimin With Kaiser Normalization

	Component			
	1	2	3	4
15. Opportunities in this community allow students to come to school ready to learn.	**.93**	.21	.14	.18
17. The opportunities in this community help ensure that these students will learn.	**.86**	.27	.30	.12
13. The quality of school facilities here really facilitates the teaching and learning process.	**.74**	.38	.09	.07
14. The students here come in with so many advantages they are bound to learn.	**.72**	.14	.43	-.12
7. Noncertified staff in this school are well-prepared to perform their assigned duties.	**.62**	.19	-.03	.59
21. Noncertified staff in this school truly believe every child can learn.	**.60**	.58	.01	.40
6. Noncertified staff in this school are skilled in various methods of meeting students' needs.	.36	**.88**	.07	-.12
5. If a child doesn't learn something the first time, noncertified staff will support trying another way.	.35	**.84**	-.02	.15
9. Noncertified staff in this school have what it takes to get the children to respond to them.	.37	**.77**	.26	-.08
1. Noncertified staff in the school are able to help get through to the most difficult students.	.03	**.73**	.29	.17
Qu4 Reverse Coded	-.15	**.62**	.57	.30
Qu16 Reverse Coded	.14	.03	**.79**	-.04
Qu8 Reversed Coded	.24	.27	**.67**	-.06
Qu12 Reverse Coded	.07	.55	**.67**	.17
Qu19 Reverse Coded	.09	.07	**.60**	.45
2. Noncertified staff here are confident they will be able to help motivate students.	.38	.30	**.54**	.28
Qu10 Reverse Coded	.05	-.11	-.03	**.77**
Qu3 reversed coded	.03	.43	.23	**.71**
Qu18 Reverse Coded	.52	.11	.49	**.60**

Note. Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.

Cronbach’s Alpha Analysis

A Cronbach’s alpha is a statistical test that assists the researcher in knowing the level of reliability (Laerd Statistics, 2018b). Cronbach’s Alpha is used to determine how many of the items on a scale are measuring the same concept (Laerd Statistics, 2018b). The researcher was seeking a Cronbach’s Alpha scores of .70 or greater (Laerd Statistics, 2018b). A questionnaire was employed to measure different, underlying constructs that summed up the overall construct of collective efficacy of noncertified staff (see Appendix E). One construct, “the opportunities in this community help ensure that these students will learn” consisted of six questions (Questions 15, 17, 13, 14, 7, and 21). The scale had a high level of internal consistency, as determined by a Cronbach’s alpha of .86 (see Table 4).

Table 4

Reliability Statistics for “The opportunities in this community help ensure that these students will learn”

Cronbach's alpha	Cronbach's alpha based on standardized items	*N* of items
.86	.87	6

The second construct measured by the questionnaire was “noncertified school staff here are well prepared to teach the subjects they are assigned to teach,” which consisted of five questions (Questions 6, 9, 5, 1, and 4). The scale had a high level of internal consistency, as determined by a Cronbach’s alpha of .84 (see Table 5).

Table 5

Reliability Statistics for " Noncertified staff in this school are well prepared to teach the subjects they are assigned to teach"

Cronbach's alpha	Cronbach's alpha based on standardized items	*N* of items
.84	.84	5

The third construct measured by the questionnaire was "noncertified school staff here don't have the skills needed to assist in producing meaningful student learning," which consisted of five questions (16, 8, 12, 19, and 2). The scale had a good level of internal consistency, as determined by a Cronbach's alpha of .72 (see Table 6).

Table 6

Reliability Statistics for "Noncertified school staff here don't have the skills needed to assist in producing meaningful student learning"

Cronbach's alpha	Cronbach's alpha based on standardized items	*N* of items
.72	.72	5

The last construct measured by the questionnaire was "the lack of supplies in this school makes assisting in student learning very difficult," which consisted of three questions (Questions 10, 3, and 18). The scale did not have a high level of internal consistency, as determined by a Cronbach's alpha of .60. Due to the low Cronbach's alpha, the results from this construct need to be interpreted with caution (see Table 7).

Table 7

Reliability Statistics for "The lack of supplies in this school makes assisting in student learning very difficult"

Cronbach's alpha	Cronbach's alpha based on standardized items	*N* of items
.60	.60	3

A summary of the results may be viewed visually in Table 8.

Table 8

Summary of Results

Component name	Items	Item loading	% of variance (cumulative)	Cronbach's reliability coefficient	Eigen values
The opportunities in this community help ensure that these students will learn.	15 17 13 14 7 21	0.93 0.86 0.74 0.72 0.62 0.60	32.11 (32.11)	0.86	6.10
Noncertified staff in this school are well prepared to teach the subjects they are assigned to teach.	6 5 9 1 4	0.88 0.84 0.77 0.73 0.62	13.17 (45.28)	0.84	2.50
Noncertified school staff here don’t have the skills needed to assist in producing meaningful student learning.	16 8 12 19 2	0.79 0.67 0.67 0.60 0.54	11.90 (57.18)	0.72	2.26
The lack of supplies in this school makes assisting in student learning very difficult.	10 3 18	0.77 0.71 0.60	9.92 (67.10)	0.60	1.89

Subjects and Data Cleaning

After completion of the PCA for the pilot survey, the researcher was able to move forward and survey schools throughout the state of Missouri. A total of 510 emails requesting participation were sent to public high school principals in Missouri, as well as

four public school assistant superintendents. Emails were sent to DESE-recognized Missouri public high schools and requested participation from both certified and noncertified staff (see Appendix A). Links to the specific surveys were included in the email to the districts. A total of 228 certified staff responded to the survey and 85 noncertified staff responded to the survey. The certified staff positions are listed in Table 9, which consisted of teachers, counselors, and administrators. The positions of noncertified staff are listed in Table 10.

Table 9

Certified Positions Held at District/High School

Position	Number of participants
Teacher	261
Counselor	21
Administrator	27
Director	6
Other[a]	20

Note. Certified Staff Positions Survey
[a] Not indicated on survey responses.

Table 10

Noncertified Positions Held at District/High School

Position	Number of participants
Paraprofessional	56
Food Services	10
Custodian	5
Bus Driver	3
School Resource Officer	0
Secretary	30
Maintenance	3
Other[a]	28

Note. Noncertified Staff Positions Survey.
[a] Bookkeeper, nurse, registrar, school social worker, library clerk, home to school coordinator, substitute, technology personnel, district datacom engineer, campus supervisor, family and consumer science teacher, and noncertified teachers.

After all responses were collected, the researcher used an Excel document to clean the data. Any duplicate surveys, incomplete surveys, or any participant who did not indicate a specific district or high school were removed. In total, there were 75 noncertified surveys and 204 certified surveys used to run the multiple regression analysis.

Data Analysis and Findings

In order to answer the research questions, the researcher conducted two multiple regression analyses. A multiple regression analysis, which is an extension of a simple linear regression, is used in order to predict a continuous dependent variable based upon several independent variables; additionally, multiple regression allows the researcher to determine the overall fit of the model and how the predictor variables contribute to the total variance explained (Laerd Statistics, 2018a). For this study, the researcher was determining if ACT scores and population contributed to collective efficacy of certified and noncertified staff.

There are eight assumptions needed to run a multiple regression. First, the researcher determined the continuous dependent variable for this study would be the linear combination of school size and Missouri ACT test scores. Missouri ACT test scores and school size would both be continuous variables based upon the test performance of ACT scores and varied school size (Laerd Statistics, 2018a). Second, two or more continuous independent variables were also needed to run a multiple regression. For this study, the continuous independent variables were the overall collective efficacy scores of certified staff measured by Goddard et al.'s (2000a) Collective Efficacy Scale, and the overall collective efficacy noncertified scores measured by the pilot scale for noncertified staff.

The researcher ran a multiple regression analysis to predict the linear combination of school size and Missouri ACT test scores from the collective efficacy of certified staff measured by Goddard et al.'s (2000a) Collective Efficacy Scale. After the first two assumptions for multiple regression were met from the study design, the next six assumptions were assessed after running the analysis. For the first assumption, the researcher sought to confirm there was independence of residuals as assessed by a Durbin-Watson analysis (Laerd Statistics, 2018a). Independence of residuals indicates that the independent variables, or observations, are not related (Laerd Statistics, 2018a). Durbin-Watson values can range from 0 to 4, however, the researcher sought to have a value close to the value of 2. For this study, the Durbin-Watson statistic was that of 2.09, thus statistically showing an independence of residuals and meeting the assumption.

The next assumption needed was that the independent variables are collectively related linearly to the dependent variables as well as each independent variables are linearly related to the dependent variable. The researcher saw linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. Linearity is represented by the scatter plots and/or partial regression plots presented undeviating data (Laerd Statistics, 2018a). Studentized residuals are used to identify outliers, as outliers could potentially distort the regression line and affect the model's goodness of fit. In order to determine outliers, studentized residuals reflect the number of standard deviations away from the regression line. In a regression model, the studentized residuals allow the researcher to compare the differences between the predicted and observed target values across various predictor values (Laerd Statistics, 2018a). The linearity presented in the partial regression plots met the assumption needed that the

independent variables are collectively related linearly to the dependent variables, as well as each independent variable were linearly related to the dependent variable.

The next assumption was the data needed to show homoscedasticity. The researcher examined whether there was homoscedasticity, or the variance across the line of best fit remained consistent, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values. Homoscedasticity is where the variance remains consistent along the line of best fit (Laerd Statistics, 2018a). By examining the consistent spread of residuals across the plot with no increase or decrease of the spread of residuals, the researcher was able to confirm homoscedasticity (see Appendix F).

Next, the data must show multicollinearity. Multicollinearity occurs when there is the correlation between two or more independent variables (Laerd Statistics, 2018a). The researcher was seeking no multicollinearity, which is assessed by tolerance values greater than 0.1. For this study, there was no evidence of multicollinearity, as assessed by tolerance values of 0.6, which were greater than 0.1.

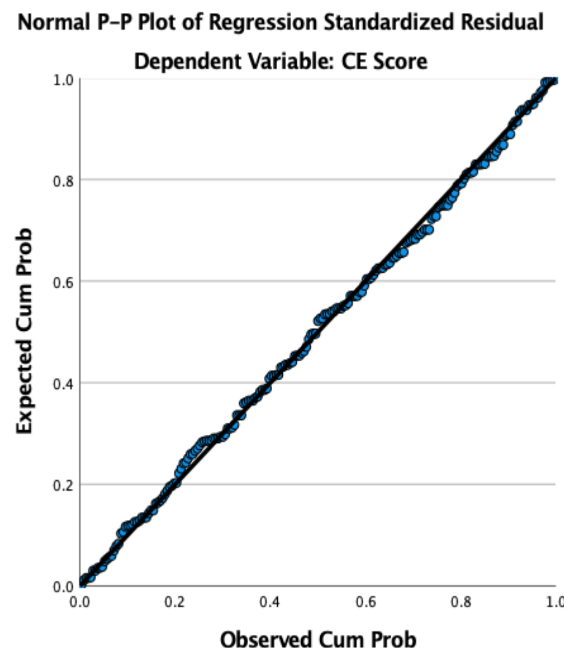
For the next assumption, the researcher sought to check three types of unusual points: outliers, high leverage points, and highly influential points (Laerd Statistics, 2018a). In order to assess outliers, the researcher utilized a Casewise Diagnostics table, which highlighted any standardized residual greater than ±3 standard deviations. For this study, there were no standardized deleted residuals, which are points that are not on the line of best fit, greater than ±3 standard deviations; additionally, there were no leverage values, which are unusual points that may impact the regression line, greater than 0.2. Lastly, Cook's distance is used to determine if there are any influential outliers in the data

and the researcher sought to have no values for Cook's distance above 1. The results for this study showed there were no values for Cook's distance above 1.

Next, in order for the researcher to determine statistical significance, the residuals need to be distributed normally (Laerd Statistics, 2018a). One of the ways residuals can visually be distributed normally is through a normal P-P Plot of the studentized residuals (Laerd Statistics, 2018a). Researchers examine if the points are closely aligned across the diagonal line in a P-P Plot. For this study, the researcher found the assumption of normality was met, as visually assessed by a P-P Plot (see Figure 2)

Figure 2

Normal P-P Plot of Regression Standardized Residual Dependent Variable: CE Score



The multiple regression model (see Tables 11 and 12) did statistically significantly predict CE score, $F(2, 202) = 9.90$, $p < .001$, adj. $R^2 = .09$; efficacy score =

65.96 + (ACT score x .436) + (population x .001). However, the coefficient of determination, $R^2 = .09$, explained 9% of the variability of the dependent variable (see Table 12). Furthermore, the researcher examined the adjusted R^2 value, which corrects the positive bias of R^2 to provide an expected value in the population and is an estimate of effect size (Laerd Statistics, 2018b). For this study, the adjusted $R^2 = .09$, meaning 9% of the effect size, which is very small according to Cohen's (1988) classification (see Table 13). Population was the only variable that added statistically significantly to the prediction, $p = .034$. Regression coefficients and standard errors can be found in Table 13.

Table 11

ANOVA Results for Certified Staff

Model	Sum of squares	*df*	Mean square	*F*	Sig.
Regression	464.72	2	232.36	9.86	<.001[a]
Residual	4760.58	202	23.57		
Total	5225.30	204			

Note. Dependent Variable: CE Score.
[a] Predictors: (Constant), Population, ACT

Table 12

Model Summary: Certified Staff

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Durbin-Watson
1	.30[a]	.09	.08	4.86	2.09

Note. Dependent Variable: CE Score.
[a] Predictors: (Constant), Population, ACT

Table 13

Multiple Regression Coefficients Table for Certified Staff

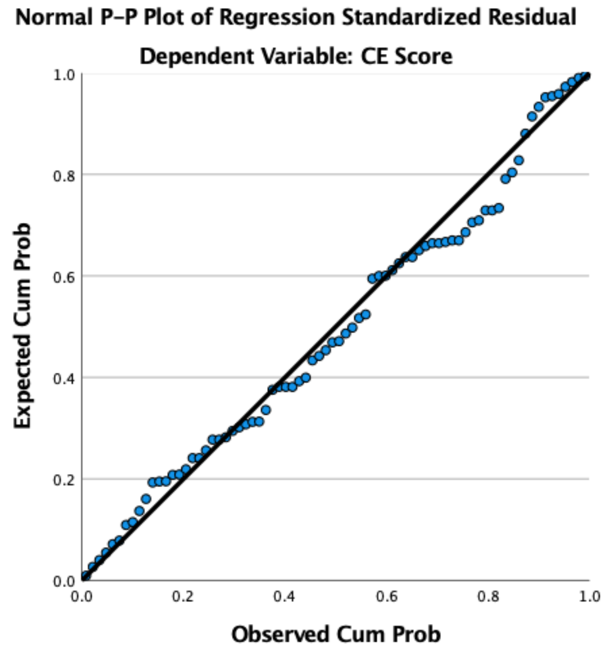
Model	Unstandardized Coefficients *B*	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
(Constant)	65.96	4.92		13.41	<.001	56.26	75.66		
ACT	.44	.26	.15	1.68	.094	-.08	.95	.60	1.65
Population	.00**	.00**	.19	2.14	.034	.00	.00**	.60	1.65

** $p < .01$.

Next, the researcher ran a multiple regression analysis to predict the linear combination of school size and Missouri ACT test scores from the collective efficacy of noncertified staff measured by Goddard et al.'s (2000a) Collective Efficacy Scale. There was linearity as assessed by partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.941. There was homoscedasticity, as assessed by visual inspection of a plot of studentized residuals versus unstandardized predicted values (see Appendix G). There was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. There were no studentized deleted residuals greater than ±2.5 standard deviations, no leverage values greater than 0.2, and values for Cook's distance above 1. The assumption of normality was met, as assessed by a P-P Plot (see Figure 3).

Figure 3

Normal P-P Plot of Regression Standardized Residual Dependent Variable: Noncertified CE Score



The multiple regression model (see Table 14 and 15) did not statistically significantly predict CE Score of noncertified staff, $F(2, 73) = 2.92$, $p = .060$, adj. $R^2 = .074$; predicted noncertified collective staff efficacy score = 85.69 - (ACT score x .927) + (population x .003). Each variable added statistical significance to the prediction, where ACT score was $p = .04$ and population was $p = .02$ (see Table 16). Regression coefficients and standard errors can be found in Table 16. The overall value of R^2 for the model was 7.4% with an adjusted R^2 of 4.9% (see Table 15), indicating a very small effect size according to Cohen (1988).

Table 14

ANOVA Results for Noncertified Staff

Model	Sum of Squares	*df*	Mean Square	*F*	Sig.
Regression	170.00	2	85.00	2.92	.060[a]
Residual	2121.93	73	29.07		
Total	2291.93	75			

Note. Dependent Variable: CE Score.
[a] Predictors: (Constant), Population, ACT Score

Table 15

Model Summary: Noncertified Staff

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Durbin-Watson
1	.27[a]	.07	.05	5.39	1.94

Note. Dependent Variable: CE Score.
[a] Predictors: (Constant), Population, ACT Score

Table 16

Multiple Regression Coefficients Table for Noncertified Staff

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model	*B*	Std. Error	Beta	*T*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	85.69	8.73		9.82	<.001	68.30	103.08		
ACT	-.93	.46	-.30	-2.01	.048	-1.84	-.00**	.58	1.72
Population	.00**	.00**	.34	2.33	.023	.00**	.00**	.58	1.72

** $p < .01$.

In conclusion, the researcher found both multiple regression analyses showed a very small adjusted R^2 value.

Summary

With the increase of low-performing schools in the world, schools continue to feel the pressure to achieve proficiency (Guidetti et al., 2018; Mosoge et al., 2018). Multiple studies have supplied a positive correlation between collective teacher efficacy and student success (Buonomo et al., 2020; Surana, 2021; Thornton et al., 2020). Furthermore, teacher efficacy can be achieved through proper and continuous training, which can help increase collective efficacy within a school (Bandura, 1994; Lowder, 2017). Goddard (2001) also stated, within a school, past success may increase collective teacher efficacy while failure may cause the collective staff efficacy to decrease. Although there has been much research in certified staff efficacy, there is a gap in the literature regarding the impact of noncertified collective staff efficacy within a school district (Fortenberry, 1991). With past studies showing a positive relationship between collective teacher efficacy and student success (Bieliune, 2018; Goddard, 2001; Goddard et al., 2004; MacNeil et al., 2009), one may wonder about the potential impact noncertified collective staff efficacy could have on the academic success of students.

This study sought to fill the gap in literature of the relationship between collective noncertified staff efficacy and student achievement as there is a lack of research in non-certified collective efficacy (Fortenberry, 1991). This quantitative correlational study focused on the relationship between certified and noncertified collective staff efficacy and ACT scores of Missouri high school students. The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri Public high school students' ACT scores. Additionally, it could be beneficial for future

educational leaders to gain insight into noncertified collective staff efficacy and how that may relate to building culture, school size, and as a result, student achievement.

Chapter Four contained the findings for this quantitative, correlational study. The researcher contacted 510 public high school principals in the state of Missouri. Of the 510 schools asked to participate in the surveys, 39 schools responded, yielding 204 completed certified staff surveys and 75 completed noncertified staff surveys. Two independent multiple regression analyses were performed for Research Questions 1a and 1b. The multiple regression model did not predict CE scores with statistical significance. Based upon the data, the researcher was unable to reject the null hypothesis. Similarly, the analysis of the multiple regression of the noncertified survey responses showed no statistical significance when predicting CE scores based upon ACT score and population. Therefore, the researcher was unable to reject the null hypothesis. In the following chapter, the researcher summarized the findings and conclusions from the data. Additionally, implications and recommendations for further research were provided.

Chapter Five

Conclusions and Recommendations

Introduction

Measuring the effectiveness of school culture has served as a dilemma for schools as culture, traditionally, has been measured through administrator-teacher relationships (Fortenberry, 1991). However, another aspect of school culture is the effect of collective staff efficacy on student achievement. Collective staff efficacy has played an imperative role in student outcomes including the perception of staff members' influence in the outcomes of student performance. From an educational lens, collective efficacy can be important for student success within a school district (Goddard et al., 2004). Many studies have shown the relationship between the collective efficacy of certified staff and student performance (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). These studies have helped shape the collective efficacy of certified staff and the impact collective efficacy has on a school district.

Much of the current research on collective staff efficacy has focused research on certified staff (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). While Fortenberry (1991) conducted a study on measuring the efficacy of school noncertified staff on student retention, there has been a lack of research on correlation between the perception of the collective staff efficacy and student achievement, particularly when including both certified and noncertified support staff. The paucity of research understanding how collective certified staff

efficacy compared to collective noncertified staff efficacy is connected to student achievement creates a problem for assessing culture and the climate of a school (Fortenberry, 1991). This quantitative study attempted to measure the relationship between collective efficacy of certified and noncertified staff and Missouri high school ACT scores. Goddard et al.'s (2000a) Collective Efficacy Scale was used as the survey to measure certified collective efficacy, and a revised version was developed, piloted, and then used to survey noncertified collective staff efficacy.

However, limitations to the research may have impacted the outcome. Of the 510 surveyed high schools, 39 responded, accounting for 204 certified staff-completed surveys and 75 noncertified staff-completed surveys. Total responses, including completed and not completed, for the certified staff survey was 340. However, the certified staff had a completion rate of 67.06% as the researcher had to eliminate some surveys that did not contain enough information. The noncertified staff survey yielded 150 responses with a dropout rate of 56.67%.

In Chapter Five, the researcher discussed the results of the study through interpretation and analysis of the methods used to collect and evaluate the data. Furthermore, the researcher included an overall summary of the findings in order to answer the research questions, specifically focusing on the multiple regression analysis for both certified and noncertified staff, then exploring an in-depth discussion of the findings for overall collective staff efficacy. The researcher also discussed educational implications and recommendations for future research in collective efficacy and education. Finally, the researcher concluded the chapter with discussion based upon the analysis and integration of the data.

Summary of Findings

The research was conducted in order to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to the linear combination of school size and Missouri public high school students' ACT scores. The researcher wanted to address the lack of research regarding noncertified collective staff efficacy and how that may relate to school size, building culture, and student achievement. The researcher utilized two surveys for this study: Goddard et al.'s (2000a) Collective Staff Efficacy Scale was given to certified staff and a revised version of noncertified collective staff efficacy scale was given to noncertified staff. The following sections provide a summary of findings for each of the research questions.

Research Question 1a attempted to determine the predictive relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year. The researcher utilized Goddard et al.'s (2000a) Collective Staff Efficacy Scale to survey certified staff. After a multiple regression was run on the data, the results revealed there was statistically significance, $p < .001$, and the researcher was able to reject the null hypothesis. Additionally, the researcher found population added to the statistical significance, $p = .034$, with the coefficient value of .001. ACT score was not statistically significant, $p = .094$, and had a coefficient value of .436. Furthermore, it is important to note that although population may be statistically significant, the coefficient was very small and did not greatly impact the prediction equation.

Furthermore, although the independent variable ACT score was not statistically significant, the researcher sought to keep the variable because of theoretical importance.

Due to the research questions and the researcher examining student academic success, the need to keep the independent variable made sense. Additionally, past research has shown how collective efficacy impacts student learning (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). Therefore, since past research has shown the relationship between collective efficacy and student achievement, the researcher kept the independent variable for this study even though the independent variable did not add statistical significance.

Research Question 1b attempted to determine the predictive relationship between noncertified collective staff efficacy as measured by the researcher's revised version of noncertified collective staff efficacy scale and the linear combination of school size and ACT test scores in the 2019-2020 school year. After a multiple regression was run on the data, the results revealed there was not statistical significance, $p < .06$, and the researcher failed to reject the null hypothesis. However, it is important to note that population, $p = .023$, and ACT scores, $p = .048$, were both added to the statistical significance. Furthermore, the population coefficient was .003, while ACT score coefficient value of -.927.

Discussion

The results of this research sought to add to the overall knowledge base of collective efficacy, specifically, collective efficacy of noncertified staff. As studies continue to show the impact of collective efficacy on student achievement (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019), this research sought to benefit future educational leaders in building a culture of collective efficacy. Furthermore, this research sought to add to the knowledge

base regarding noncertified collective staff efficacy as there has been a lack of research in this area (Fortenberry, 1991).

The results for Research Question 1a indicated statical significance between certified collective staff efficacy as measured by Goddard's et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year. These results were expected as they aligned with Hattie and Zierer's (2019) work with high collective teacher efficacy impacting student achievement; however, it is important to note that population was the only variable that added statistical significance to the predication equation, which was an unexpected result. Although population added statistical significance, the value was very small, $B = .001$. Little research has been completed on whether school population affects overall collective efficacy.

Furthermore, the ACT scores may not have shown statistical significance in this study due to other factors contributing to the overall ACT scores, as well as student success of a high school. For example, factors impacting the overall ACT scores of a school and student success may include but is not limited to student expectations, teacher clarity, feedback, teacher-student relationship, prior achievement, socioeconomic status, home environment, mathematics programs, and school leadership (Donohoo, 2017). The factors contributing to the ACT data scores gathered for this study could have been indicative of a variety of the listed reasons rather than the overall collective efficacy of staff members. Future researchers could focus on one of these focused areas impacting student success, rather than a standardized test assessment. In studying one of the focal

points of student success, rather than the overall ACT scores, future researchers could, potentially, obtain cleaner research with less ambiguity.

Lastly, while the results indicated a statistically significant difference, the effect size was very small according to Cohen (1998). The adjusted R^2 value = .080, meaning the effect size was 8%. Therefore, with the very small effect size, this study can be difficult to compare to other similar studies.

The results for Research Question 1b indicated no statistical significance between the predictive relationship between noncertified collective staff efficacy as measured by the researcher's revised version of noncertified collective staff efficacy scale and the linear combination of school size and ACT test scores in the 2019-2020 school year. As many studies have shown relationship between certified collective efficacy and student achievement (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019), the researcher thought the same outcome for noncertified staff collective efficacy and student achievement. The results, however, stated otherwise. It is important to note both independent variables, population, and ACT scores added statistical significance to the predication equation. Since there was no past research in collective efficacy of noncertified staff and student achievement, the researcher had difficulty comparing the results of this study with others.

One reason why the overall revised noncertified collective staff efficacy survey results were not statistically significant may be attributed to the premise that many of the noncertified staff members were not in actual positions of teaching, writing lesson plans, or aiding to the direct instruction within the classroom. The researcher had a variety of completed noncertified staff surveys from secretaries, bus drivers, food service workers,

resource officers, and maintenance workers. Many of these noncertified staff duties were not related to pedagogy within the classroom. Therefore, some questions on the revised noncertified collective staff efficacy survey that tied to student performance, student achievement, and student discipline might have been difficult to answer for many of the noncertified staff. For example, a school maintenance worker may have had trouble articulating how they impacted student learning since they were not a part of direct instruction or assisting within the classroom. These types of questions may need to be revised for future studies in surveying noncertified collective staff efficacy with regard to the area of research. In this study it was achievement, however others may want to focus on school culture, morale, student discipline, or attendance. Nevertheless, noncertified staff do have an influence on these areas whereas for achievement, it is mainly paraprofessionals and personal assistants (Brock & Anderson, 2020; Layden et al., 2018; Loughland & Ryan, 2022; Reddy et al., 2021; Rosenberg et al., 2020; Wermer et al., 2018; Zobell & Hwang, 2020).

It is important to note if the researcher would have only surveyed paraprofessionals, the researcher may have seen a higher impact of the independent variables on the predication criterion. Past studies have shown noncertified staff efficacy has predominately affirmed paraprofessionals' effect on student achievement; factors affecting student achievement include paraprofessional training (Brock & Anderson, 2020; Loughland & Ryan, 2022; Rosenberg et al., 2020; Wermer et al., 2018; Zobell & Hwang, 2020), professional development (Layden et al., 2018; Reddy et al., 2021), and impact on school culture (Scott et al., 2021). Future researchers may choose to focus

solely on paraprofessionals and the impact of their collective efficacy in school districts and student performance.

The theoretical framework of Goddard et al.'s (2004) perceived collective efficacy was used for this study. Perceived collective efficacy is the combined members' collective belief regarding the performance of the organization. Studies have shown that collective efficacy increases student achievement (Bieliune, 2018; Donohoo & Katz, 2019; Hoy et al., 2002; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). As indicated earlier, these studies did not show a strong relationship between collective efficacy and student achievement.

Results from this study provide educational leaders with important factors when considering how to cultivate collective staff efficacy within a school. However, due to the limitations of this study, results should be utilized with caution. The result of this study only reflects certified and noncertified staff from Missouri public school districts that engaged in taking the survey. Of the 510 surveyed high schools, only 39 high schools responded, accounting for 205 certified staff-completed surveys and 75 noncertified staff-completed surveys. Furthermore, although Research Question 1a showed statistical significance, the effect size was very small. Lastly, the revised survey for noncertified staff may have gotten better results from only surveying paraprofessionals, instead of all noncertified staff. The lack of results could have been indicative of the lack of knowledge noncertified staff have with student discipline and student achievement. For example, a bus driver may not have any knowledge in student achievement, thus, answering the survey questions regarding student achievement may have been difficult. Future

researchers may expand on these results by surveying larger populations of certified school staff and noncertified school staff.

Professional Implications

This study adds quantitative data to the body of research supporting the idea of collective efficacy and student achievement. While the data indicated mixed results, the data and instruments can be used for future research on noncertified collective efficacy. Based upon the findings of this study, there are many things upon which educational leaders can focus on when developing collective efficacy in their schools.

Research Questions 1a attempted to determine the predictive relationship between certified collective staff efficacy as measured by Goddard et al.'s (2000a) Collective Staff Efficacy Scale and the linear combination of school size and ACT test scores in the 2019-2020 school year. Even though the effect size was small, the results were statistically significant, $p < .001$. With population being the only variable adding statistical significance to the predication, one may wonder if school size plays a notable role in establishing collective efficacy.

Since educational leaders currently have no control over school population, and population showing no significant impact on the overall certified collective staff efficacy for this study, educational leaders should focus on school culture with the emphasis on establishing collective efficacy, regardless of the population of the school (Donohoo, 2017; Goddard et al., 2000b; Smith & Shouppe, 2018). Collective efficacy has been shown to be a major influence in school culture through the perceptions, motivations, and feelings from the staff (Donohoo et al., 2018). Furthermore, since many studies have shown the correlation between collective staff efficacy and student achievement

(Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019), educational leadership should work to cultivate a high collective staff efficacy through school culture to impact student achievement.

School culture is commonly defined as the glue that holds a school together (Gülşen & Çelik, 2021). Research has shown schools help create and cultivate culture and school principals can play a major role in representing culture (R. Atasoy, 2020; Karada & Öztekin, 2018; Tonich, 2021). According to Schein (1990), there are three levels of culture to help articulate and measure school culture. Tangible artifacts are the first level that encompasses many of the daily routines, ceremonies, and rituals that are most obvious to a bystander (Schein, 1990; Stolp & Smith, 1995; Susca, 2019). School leaders can use daily routines, traditions, and practices in order to build culture in their schools. The second level of culture is values and beliefs (Schein, 1990; Stolp & Smith, 1995). School leaders can help challenge and develop school faculty thinking and beliefs by cultivating a culture of student growth and achievement. The collective norms and beliefs are based upon the teachers and whether they think they can influence student achievement (Goddard et al., 2000b). Lastly, the third level of culture is the underlying assumptions of a school, or the noticeable changes that cause a shift in culture. These assumptions are the deepest level and take time to develop. Over time, educational leaders can build school culture through decisions that once embedded can cause noticeable change. Finally, student achievement (Smith & Shouppe, 2018; Wong et al., 2019), school safety (Ruiz et al., 2018), and school climate (Türker & Kahraman, 2021) can all help play a role in building school culture.

Although the results for Research Question 1b were not statistically significant, $p = .06$, this study helped add to the gap in the overall knowledge of noncertified collective staff efficacy. Nevertheless, it is important to note both coefficient variables, population, and ACT scores added statistical significance to the prediction. These results may help future researchers gain understanding of variables that may impact noncertified collective efficacy.

Additionally, the results of this study point to the lack of knowledge and research in determining if noncertified staff, regardless of job title, believe they impact student achievement. Goddard et al. (2004) stated that perceived collective efficacy is the combined members' collective belief regarding the performance of the organization. If the focus of noncertified staff solely relies on their specific job duties, this could result in the lack of understanding of how all noncertified school staff could, potentially, help impact student achievement in a school. For this study, the noncertified staff who took the survey could have been thinking in the realm of their specific job duty, rather than how their job duty could impact student performance, student achievement, and student discipline.

Furthermore, since the researcher failed to reject the null hypothesis of Research Question 1b, one may consider how to implement and grow noncertified collective efficacy, practically speaking, within a school. One way educational leaders could do this is by focusing on enhancing collective efficacy of noncertified staff, specifically, on student achievement through the four sources for collective efficacy: collective mastery experience, collective vicarious experience, collective social persuasion, and collective affective states (Bandura, 1994; Goddard et al., 2004).

Collective mastery experiences are gained through learned behavior of group members, thus collective learning occurs (Goddard et al., 2004). Since many of the noncertified staff members in this study obtain mastery experience through the practice of their specific job duty, the results of this study may indicate lack of knowledge of noncertified staff answers to questions regarding pedagogy, managing student behavior, and influencing student success. Educational leaders may benefit in including noncertified staff in various opportunities for pedagogy in the classroom. For example, an educational leader could cultivate noncertified collective staff efficacy in student learning by inviting several food service staff members into a business classroom to discuss the logistics of buying, cooking, and preparing the food each day for students. By including noncertified staff in pedagogy in the classroom or professional development with the focus point of student success, these collective mastery experiences could help noncertified staff acquire more knowledge of how collective efficacy cultivates student success.

Another way for educational leaders to help build noncertified collective staff efficacy is by developing a skill through an observed behavior, or collective vicarious experience (Goddard et al., 2004). A practical example of a vicarious experience could entail educational leaders providing professional development for bus drivers on managing student behavior. By providing examples, techniques, and skills on how to manage students in the classroom, educational leaders could help provide the same techniques and skills for bus drivers. In doing this, one could potentially increase noncertified collective staff efficacy. Next, collective social persuasion could be accomplished through positive communication and constructive feedback (Bandura,

1994; Goddard et al., 2004). Educational leaders could encourage noncertified staff to think about student achievement and how their specific job duty could enhance, aid, or support overall student achievement. The communication and persuasion of educational leaders could help enhance collective efficacy of noncertified staff. Lastly, collective affective states could be built through the beliefs and values of a school (Goddard et al., 2004). Schools that are weaker in beliefs and values may cause staff members to lose confidence and lack collective efficacy, or failure could take place (Goddard et al., 2004). Educational leaders could continue to communicate and emulate the values and beliefs of the school to aid in the overall school culture as well as collective efficacy of noncertified staff. All of these sources of collective efficacy should be examined when educational leaders seek to increase collective efficacy of noncertified staff. Lastly, educational leaders should continue to build school culture as school culture has an influence on teacher perceptions, which can help influence school personnel to establish efficacy and impact student achievement (Min, 2019). As building school culture continues to be an imperative factor in collective efficacy, educational leaders should develop staff morale, tangible artifacts, values, and beliefs, and eventually embedded underlying assumptions to improve school culture within their buildings (Schein, 1990).

Based upon the results of this study and the lack of statistical significance, one may wonder if these sources of collective efficacy could enhance overall noncertified collective staff efficacy. As past studies have shown there is a positive relationship in collective efficacy of certified staff and student achievement (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al.,

2019), one may wonder if noncertified staff could have the same results in student achievement.

Finally, the researcher was able to develop a revised instrument through this study. This instrument can serve as a starting point for future researchers seeking to learn more about noncertified collective efficacy. The researcher in this study employed a panel of experts, ran a pilot study, and utilized statistical analysis to determine reliability and validity of the instrument developed for use with noncertified staff members. Since there is a lack of research in collective efficacy of noncertified staff, it is the hope of this researcher that future researchers will be able to use the instrument to conduct additional studies examining noncertified collective efficacy and add further information to the current educational knowledge base. With the paucity of research in noncertified collective staff efficacy (Fortenberry, 1991), this research and developed instrument has helped fill the gap in literature and aided future research. Lastly, there may be some benefit in revising this instrument in order to survey collective efficacy of noncertified staff who do not work directly in the classroom.

Recommendations for Future Research

The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri public high school students' ACT scores. Additionally, it could be beneficial for future educational leaders to gain insight into collective noncertified staff efficacy and how that may relate to building culture, school size, and as a result, student achievement. The information gathered may be of value for school leaders and educators when planning for implementation of establishing and cultivating

collective efficacy in both certified and noncertified school staff. The following recommendations from the researcher may help assist in future research of collective efficacy in certified and noncertified staff:

1. Future research should focus on the relationship of collective efficacy and other assessments (End of Course exams, etc.), attendance, staff retention, and/or stakeholders' view of a school district.
2. A replication of this study could be improved by using a qualitative or mixed methods design. Interviewing various certified and noncertified school personnel may aid in the overall understanding of noncertified collective efficacy.
3. A replication of this study surveying elementary, intermediate, or middle level educators may help future research. Including various school levels would open the study to a range of perceptions, which would help gain better understanding of collective efficacy in school districts.
4. Researchers may use the noncertified collective staff efficacy survey to conduct future research in the field of noncertified collective staff efficacy. It is still the belief of the researcher that the collective efficacy of noncertified staff and its effect on school culture can impact student achievement, the values, and beliefs of a school, and overall school climate.
5. Researchers can use the instrument to study individual groups of noncertified staff in order to examine if one group assists in the overall collective efficacy of a school over another group.

Conclusions

The impact of school culture on student performance has been an ongoing topic in the United States. An aspect of school culture is the effect of collective staff efficacy on student achievement. Collective staff efficacy has played an imperative role in student outcomes including the perception of staff members' influence in the outcomes of student performance. Studies have shown the relationship between the collective efficacy of certified staff and student performance (Bieliune, 2018; DeWitt, 2019; MacNeil et al., 2009; Ruiz et al., 2018; Smith & Shouppe, 2018; Wong et al., 2019). With the amount of pressure on schools to achieve proficiency, collective efficacy may be a resource schools can develop (Guidetti et al., 2018; Mosoge et al., 2018). Although there has been much research in certified staff efficacy, there is a gap in current literature regarding the noncertified collective staff efficacy within a school district (Fortenberry, 1991; Goddard et al., 2004). This research sought to fill the gap in literature of noncertified collective staff efficacy.

The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri public high school students' ACT scores. The researcher was able to reject the null hypothesis for Research Question 1a, however, the effect size was small. Furthermore, the researcher failed to reject the null hypothesis for Research Question 1b. Both multiple regression analyses had a small effect size, which, practically speaking, was not useful in predicating the criterion. Nevertheless, the researcher narrowed the gap of research in noncertified collective staff efficacy.

Based upon the findings of this study, future research may benefit from the developed instrument, as well as researching various impacts of noncertified collective staff efficacy. Furthermore, the lack of results of this study may be indicative of the small sample size. As school leaders continue to feel the pressure to achieve student success, examining overall collective efficacy may be beneficial. School leaders can continue to work to build collective efficacy within their staff, both certified and noncertified, via collective mastery experience, collective vicarious experience, collective social persuasion, and collective affective states. Lastly, the results of this study helped fill the gap in the knowledge of noncertified collective staff efficacy and benefit future researchers' understanding of noncertified collective staff efficacy.

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Appendix A

Request for Participation

Dear HS Principal,

I am a doctoral student from Southwest Baptist University, and I am conducting a research study as part of my doctoral degree requirements. I am asking all Public HS Principals to consider participating in this research. My study is entitled, *THE RELATIONSHIP OF COLLECTIVE STAFF EFFICACY AND MISSOURI HIGH SCHOOL ACT SCORES*. The purpose of this quantitative, correlational study was to test Goddard et al.'s (2004) theory of collective efficacy by relating collective efficacy of both certified and noncertified staff to Missouri Public High School student's American College Test (ACT) Scores. My goal is to determine the effect that non-certificated staff have on ACT scores, as compared to certificated staff.

My research study is strictly voluntary, and you may choose not to participate, however I sincerely hope you will, as I believe all of our staff impact our students. There will be no individually identifiable information, remarks, comments or other identification of you as an individual participant. All results will be presented as aggregate, summary data, and you are welcome to the results at the conclusion of the study. (Email me and I will send you a copy).

The survey will last no more than 10 minutes and your participation will assist in contributing to furthering our understanding of the topic. The current literature on the subject of collective efficacy of noncertified staff is minimal and needs to be expanded. If you would like to know more information about this study, an information letter can be obtained by sending a request to cbyington@camdentonschools.org.

I hope you will take a minute to participate, and if you do, after reading this email, please forward to your certified and noncertified school staff. The links to the surveys are below:

CERTIFIED SCHOOL STAFF:

NONCERTIFIED SCHOOL STAFF:

If you have any questions, please contact me at (573) 286-9912 or feel free to email me at cbyington@camdentonschools.org or contact my advisor, Dr. Tammy Condren at tcondren@sbuniv.edu.

Thank you for your consideration,

Appendix B

Certified Staff Survey

CE-Scale

DIRECTIONS:
Indicate your level of agreement with each of the following statements from STRONGLY DISAGREE (1) to STRONGLY AGREE (6).

	Strongly Disagree					Strongly Agree
1. Teachers in the school are able to get through to the most difficult students	1	2	3	4	5	6
2. Teachers here are confident they will be able to motivate their students	1	2	3	4	5	6
3. If a child doesn't want to learn teachers here give up	1	2	3	4	5	6
4. Teachers here don't have the skills needed to produce meaningful student learning	1	2	3	4	5	6
5. If a child doesn't learn something the first time teachers will try another way	1	2	3	4	5	6
6. Teachers in this school are skilled in various methods of teaching	1	2	3	4	5	6
7. Teachers here are well-prepared to teach the subjects they are assigned to teach	1	2	3	4	5	6
8. Teachers here fail to reach some students because of poor teaching methods	1	2	3	4	5	6
9. Teachers in this school have what it takes to get the children to learn	1	2	3	4	5	6
10. The lack of instructional materials and supplies makes teaching very difficult	1	2	3	4	5	6
11. Teachers in this school do not have the skills to deal with student disciplinary problems	1	2	3	4	5	6
12. Teachers in this school think there are some students that no one can reach	1	2	3	4	5	6
13. The quality of school facilities here really facilitates the teaching and learning process	1	2	3	4	5	6
14. The students here come in with so many advantages they are bound to learn	1	2	3	4	5	6
15. These students come to school ready to learn	1	2	3	4	5	6
16. Drugs and alcohol abuse in the community make learning difficult for students here.	1	2	3	4	5	6
17. The opportunities in this community help ensure that these students will learn	1	2	3	4	5	6
18. Students here just aren't motivated to learn	1	2	3	4	5	6
19. Learning is more difficult at this school because students are worried about their safety	1	2	3	4	5	6
20. Teachers here need more training to know how to deal with these students	1	2	3	4	5	6
21. Teachers in this school truly believe every child can learn	1	2	3	4	5	6

22. What position do you hold at your district/high school?

23. Which district/high school are you employed?

Appendix C

Noncertified Staff Survey

Noncertified CE Scale

Directions:
Indicate your level of agreement with each of the following statements from STRONGLY DISAGREE (1) to STRONGLY AGREE (6).

1. Noncertified staff in the school are able to help get through to the most difficult students…1 2 3 4 5 6

2. Noncertified staff here are confident they will be able to help motivate students…………1 2 3 4 5 6

3. If a child doesn't want to learn, noncertified staff here give up…………………………….1 2 3 4 5 6

4. Noncertified staff here don't have the skills needed to support student learning…………….1 2 3 4 5 6

5. If a child doesn't learn something the first time, noncertified staff will support trying another way…….. 1 2 3 4 5 6

6. Noncertified staff in this school are skilled in various methods of meeting students' needs…. 1 2 3 4 5 6

7. Noncertified staff in this school are well-prepared to perform their assigned duties……….1 2 3 4 5 6

8. Noncertified staff here fail to reach some students because of poor methods……………….1 2 3 4 5 6

9. Noncertified staff in this school have what it takes to get the children to respond to them…..1 2 3 4 5 6

10. The lack of materials and supplies makes my job very difficult…………………………1 2 3 4 5 6

11. Noncertified staff in this school think there are some students that no one can reach……1 2 3 4 5 6

12. The quality of school facilities here really facilities the teaching and learning process….1 2 3 4 5 6

13. The students here come in with so many advantages they are bound to learn…………1 2 3 4 5 6

14. Opportunities in this community allow students to come to school ready to learn… 1 2 3 4 5 6

15. Drugs and alcohol abuse in the community make learning opportunities difficult here for students….1 2 3 4 5 6

16. The opportunities in this community help ensure these students will learn…… 1 2 3 4 5 6

17. Students here just aren't motivated to learn, based on lack of materials and supplies……1 2 3 4 5 6

18. Learning is more difficult at this school because due to the lack of materials and supplies students are worried about their safety…….1 2 3 4 5 6

19. Non-certified staff in this school truly believe every child can learn……1 2 3 4 5 6

20. What position(s) do you hold at your district/high school?

21. Which district/high school are you employed?

Appendix D

Permission to Revise Scale

Dr. Condren:

Chris may use the scale as you have described for his dissertation. I have not had time to weigh in on the question of how to modify the questions. I see no problem if you want to do that.

I wish Chris the best with the study.

Thank you.

Roger

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Appendix E

Pilot

PCA Noncertified CE Scale

Directions:
Indicate your level of agreement with each of the following statements from STRONGLY DISAGREE (1) to STRONGLY AGREE (6).

1. Noncertified staff in the school are able to help get through to the most difficult students…1 2 3 4 5 6

2. Noncertified staff here are confident they will be able to help motivate students…………1 2 3 4 5 6

3. If a child doesn't want to learn, noncertified staff here give up…………………………….1 2 3 4 5 6

4. Noncertified staff here don't have the skills needed to support student learning…………….1 2 3 4 5 6

5. If a child doesn't learn something the first time, noncertified staff will support trying another way…….. 1 2 3 4 5 6

6. Noncertified staff in this school are skilled in various methods of meeting students' needs…. 1 2 3 4 5 6

7. Noncertified staff in this school are well-prepared to perform their assigned duties……….1 2 3 4 5 6

8. Noncertified staff here fail to reach some students because of poor methods……………….1 2 3 4 5 6

9. Noncertified staff in this school have what it takes to get the children to respond to them…..1 2 3 4 5 6

10. The lack of materials and supplies makes my job very difficult…………………………1 2 3 4 5 6

11. Noncertified staff in this school do not have the sills to deal with student disciplinary problems……….1 2 3 4 5 6

12. Noncertified staff in this school think there are some students that no one can reach……1 2 3 4 5 6

13. The quality of school facilities here really facilities the teaching and learning process….1 2 3 4 5 6

14. The students here come in with so many advantages they are bound to learn…………1 2 3 4 5 6

15. Opportunities in this community allow students to come to school ready to learn… 1 2 3 4 5 6

16. Drugs and alcohol abuse in the community make learning opportunities difficult here for students….1 2 3 4 5 6

17. The opportunities in this community help ensure these students will learn…… 1 2 3 4 5 6

18. Students here just aren't motivated to learn, based on lack of materials and supplies……1 2 3 4 5 6

19. Learning is more difficult at this school because due to the lack of materials and supplies students are worried about their safety…….1 2 3 4 5 6

20. Noncertified staff here need more training to know how to deal with students….1 2 3 4 5 6

21. Noncertified staff in this school truly believe every child can learn……1 2 3 4 5 6

Appendix F

Spread of Residuals Certified Staff

Scatter Plot of Studentized Residual by Unstandardized Predicted Value

Appendix G

Spread of Residuals Noncertified Staff