2021

The Relationship Between Professional Learning Community Characteristics and Teacher Collective Efficacy in Two Midwestern Schools

Jack C. Gaham
Walden University

Walden University

College of Education

This is to certify that the doctoral study by

Jack Carlton Gaham III

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Review Committee
Dr. James Bailey, Committee Chairperson, Education Faculty
Dr. Harold Wright, Committee Member, Education Faculty
Dr. Richard Hammett, University Reviewer, Education Faculty

Chief Academic Officer and Provost
Sue Subocz, Ph.D.

Walden University
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Abstract

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by

Jack Carlton Gaham III

MA, Olivet Nazarene University, 2010

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Project Study Submitted in Partial Fulfillment

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Abstract

A suburban school in the central United States failed to close the achievement gap with a neighboring school on state-mandated tests despite both schools' implementation of a professional learning community (PLC) to improve student performance. The purpose of this quantitative study was to explore the implementation of a PLC with the mitigating variable of teacher collective efficacy (TCE) so that research-derived recommendations could be made to improve the PLC and student performance. The second school that implemented a PLC at the same time but with better results was included to evaluate the influence of school environment on PLC performance. Bandura's social learning theory grounded the study and research question, which addressed the extent to which the five dimensions of PLC implementation and school environment influence TCE. A convenience sample of 103 educators who were trained in PLCs at each school took two survey instruments: (a) the Professional Learning Communities Assessment—Revised to measure the five dimensions of PLC implementation and (b) the Collective Teacher Efficacy Scale to measure perceived TCE within each school. Multiple linear regression revealed that 68.8% of the variance in TCE could be explained by four of the five PLC dimensions. Only two, however, shared vision and values (ß = .219, $p = .020$) and supportive conditions (ß = .317, $p < .001$), were significant predictors of TCE. The dummy variable, schools, had no significant influence on level of TCE. The study addressed notable gaps in PLC practice and resulted in the creation of a professional development project to advance shared vision and values, and supportive conditions within the target school. Positive social change is achieved when school improvement programs are implemented with fidelity to close achievement gaps for students.

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Dedication

This doctorate in education is dedicated to my family. It is for my wife, Julie Gaham, who supported me throughout this journey and kept me moving forward. It is for my kids, Jack and Donna Gaham, for understanding the days when Dad was not able to play. It is for my parents, Jack and Debra Gaham, for supporting their children in chasing their dreams by pushing theirs to the side. All of you mean more to me than a simple paragraph in a project study could ever convey.

Acknowledgments

Many people have helped guide me through this project. Without them, I know I would not have been able to accomplish it. To my chairs, Dr. James Bailey and Dr. Harold Wright, thank you for all your words of wisdom and encouragement, especially during the times it did not seem worth the fight. John Schutz, your continuous reading and rereading of this document was more support than I deserve from a friend. Lastly, thank you to the Walden staff for their insights and guidance during the reviews, methodology, and coursework. Without you, I would not have been able to complete this program. It is difficult to find the words to express the joy of seeing this journey come to an end and the enormity of opportunities ahead of me. Thank you all.

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Section 1: The Problem

The landscape of education has changed over time. In 2001, President George W. Bush signed the No Child Left Behind Act (NCLB). This federal law put a spotlight on student achievement and held schools responsible for student growth. This bill was extended in 2015 when President Obama signed the Every Student Succeeds Act (ESSA). ESSA focused on student growth but removed the harsh penalties that accompanied NCLB's sole focus of students' test scores. The new act uses scores as one indicator, and it also stresses the importance of addressing school climate and student learning. Schools across the world use professional learning communities (PLCs) to improve student achievement.

The Local Problem

The problem for this study was that two neighboring junior high schools in Midwestern school districts implemented PLCs during the 2015-2016 school year to improve student achievement on state-mandated tests and achieved very different results. Implementing a PLC requires substantial investments by a school district, and when PLC implementation fails to meet expectations, a systematic inquiry is needed. The two schools in this study, referred to using the pseudonyms *School A* for the poorer performing school and *School B* for the higher performing school, had very similar demographics for their students, faculty, and staff. This led to the conclusion that the difference in PLC performance, as measured by achievement scores on state-mandated tests, was being moderated by some other variable. The state cancelled testing for the

2019–2020 school year due to the COVID-19 pandemic, so data for that year are not available. Table 1 summarizes the schools' performance data for 2016–2019.

Table 1

Percentage of Students Performing Acceptably on State Standards Tests

	School A	School B	State
2016	50%	69%	62%
2017	55%	68%	62%
2018	43%	59%	59%
2019	42%	56%	59%

When implemented with fidelity, PLCs have been strongly and significantly related to school performance (Gray & Summers, 2016; Voelkel & Chrispeels, 2017b). It has been shown that PLC performance may be mediated by teacher collective efficacy (TCE; R. Goddard et al., 2015; Voelkel & Chrispeels, 2017a), resulting in one factor of interest for this study. Five additional factors related to PLC performance are (a) supportive and shared leadership, (b) shared values and vision, (c) collective learning and application, (d) supportive conditions, and (e) shared practice (De Neve et al., 2015; DuFour & Eaker, 2009b; Horde, 2004). Without this study, school district leaders might continue to expend valuable resources for PLC implementation without fully understanding the consequences of those investments.

Rationale

The rationale for the study was based on the data collected from the state report card on student achievement through 2018. The data were collected for all students reported on the state assessment in Grades 6–8. As indicated by the plateau in student

achievement since adopting a PLC at School A and continual high scores of School B, there exists a gap in practice related to the effectiveness of PLCs as the chosen strategy to raise achievement.

Evidence of Problem at Local Level

Scores on the Partnership for Assessment of Readiness for College and Careers (PARCC) and the Illinois Assessment of Readiness (IAR) for School A showed that the percentage of students approaching, meeting, or exceeding state standards was 50% in 2016, 55% in 2017, 43% in 2018, and 42% in 2019, thus indicating declining achievement since the PLC strategy was started. The neighboring junior high, School B, scored 69% (2016), 68% (2017), 59% (2018), and 56% (2019) of students approaching, meeting, or exceeding state standards. While all scores decreased in the state due to new, more challenging standards, School B was outperforming School A and was closer to state averages. The state average scores were 62% (2016), 62% (2017), 59% (2018), and 59% (2019) of students approaching, meeting, or exceeding state standards (Illinois School Report Card, 2019). School A had not increased student achievement scores or made significant gains toward closing the gap on the state standardized test despite adopting the same PLC framework adopted by School B.

Evidence of Problem From the Literature

The purpose of a PLC is to create a learning environment for teams of teachers to collaborate and share best practices (DuFour, 2004). TCE is engendered when teachers share best practice strategies to improve student achievement (Donohoo et al., 2018). There exists a connection between team collaboration to share best practices within PLCs

and the development of TCE to improve student achievement (Voelkel & Chrispeels, 2017b). High TCE predicts a high-functioning PLC (Gilbert et al., 2018; Gray & Summers, 2015; Voelkel, 2019; Voelkel & Chrispeels, 2017b).

The significant work of PLC and TCE connections over the last 5 years has focused on an array of schools. The connection between PLC and TCE researched by Voelkel (2019) focused on middle- to high-income schools in California where the population was predominantly White (68.5%) and Asian/Pacific Islander (23.9%). Their work showed a positive correlation between teacher leadership, TCE, and the development of a PLC. Leaders need to create collaborative structures for all instructional decisions for students, instill confidence, and enhance PLC effectiveness. Gilbert et al. (2018) focused on educational leaders at a medium-size university in Georgia with a pretest sample size of 29 and a posttest size of 26. Their research showed that leaders' self-efficacy allowed them to develop and respond to PLCs, even in difficult situations. The primary efficacy-shaping sources were mastery experiences and vicarious learning. These are two of the four components of TCE development (Bandura, 1997). School leaders must implement PLCs correctly if they hope to impact student learning.

Voelkel and Chrispeels (2017b) focused on a largely suburban agricultural area where the population was predominantly Hispanic/Latino (69%) and White (18%). The researchers found a positive and high correlation between PLC implementation and TCE. They also showed that the higher rated the factors of PLC implementation were, the higher the levels of TCE in their study. Voelkel and Chrispeels (2017a) also showed that engaging in instructional practices added to teachers' beliefs in being able to accomplish

their goals. They confirmed the work of Gray and Summers (2015, 2016), who conducted research in international schools in Latin American and South American countries. Gray and Summers (2016) showed that effective PLCs have common characteristics of collaboration, supportive structures, and trust. Through their work, they suggested that PLCs are an effective model for school improvement. Gray and Summers (2015) found evidence for the importance of formal and informal structures in developing a PLC. They also noted that structures are not enough for a PLC to thrive; open and trusting relationships must be built between teachers (for collective efficacy), colleagues, and leadership.

The aforementioned researchers found that high levels of PLC implementation and establishment led to positive TCE in their respective studies. Gray and Summers (2016) noted that a PLC model can work in any school. In this study, I used similarly based supports of TCE and PLC to seek a correlation between the characteristics of the PLC and level of TCE. There appears to be a gap in practice at School A between the implementation of PLCs and the development of TCE to address student achievement.

Purpose of the Study

Using multiple linear regression and controlling for the two schools using a moderation (dummy) variable, the purpose of this quantitative study was to determine the moderating effect that school performance has on the association between PLC implementation and TCE.

Definition of Terms

Teacher collaboration: A voluntary activity between two or more teachers who, based on relational trust and respect and through collaborative leadership and school administration, coordinate efforts, reconcile different approaches, and exchange ideas and materials in order to increase teaching effectiveness as well as affective and cognitive job satisfaction (Mora-Ruano et al., 2018).

Efficacy: Belief that desired results can be affected by the choices that people make and their ability to feel capable of completing a task successfully (Bandura, 1997).

Collective efficacy: A group's shared belief in its conjoint capabilities to organize and execute courses of action required to produce given levels of attainments (R. D. Goddard & Goddard, 2001).

Teacher collective efficacy (TCE): The perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students (R. D. Goddard et al., 2020).

Professional learning community (PLC): A school organization in which a group of teachers share and question their practice from a critical point of view. This questioning happens in an ongoing, reflective, collaborative, and inclusive way (De Neve et al., 2015).

Mastery experiences: Experience in overcoming obstacles through perseverant effort (Bandura, 1998).

Vicarious experiences: Seeing people similar to oneself succeed by perseverant effort raises observers' beliefs in their own abilities (Bandura, 1998).

Social persuasion: Structural situations that bring successes and avoidance of premature situations where people are likely to fail (Bandura, 1998).

Physiological conditions: Areas of safety that reduce people's stress and depression, build their physical strength, and change misinterpretations of their physical states (Bandura, 1998).

Significance of the Study

The work of PLCs and TCE has been documented and broadened over the years as a strategy for influencing student achievement. Research has shown the effectiveness of PLC teams (Bolam et al., 2005; DuFour, 2015; DuFour & DuFour, 2013; DuFour & Eaker, 2009b; DuFour & Reason, 2016; Hallam et al., 2015). Research on collective efficacy impacting student achievement has been confirmed (Angelle & Teague, 2014; Bandura, 1998, 2000; R. D. Goddard & Goddard, 2001; R. Goddard et al., 2015; R. D. Goddard et al., 2000). This study contributes to the literature by addressing whether and how PLC characteristics are related to TCE. PLCs create time and norms for teams to assess student data, but collective efficacy plays an important role in keeping a team moving forward with initiatives. Shared experience and knowledge help develop, implement, and assess teachers' strategies to address a school's specific needs (Spanneut, 2010). This study may provide guidance for the development of PLCs to create higher TCE and therefore higher student achievement. As noted by Voelkel and Chrispeels (2017a) and Voelkel (2019), TCE is linked to improved teacher collaboration and student achievement.

This research may help to resolve low student composite scores on state tests by offering recommendations for enhancing TCE through improved PLC practices. Both, as noted, have a significant impact on student achievement. The change from NCLB to ESSA alleviated the issue with state takeover, but it did not eliminate the social stigma attached to low-achieving schools. If School A is able to turn its scores around, the school report card will be able to promote the district as high achieving.

Research Question and Hypotheses

Both schools implemented the improvement strategy of a PLC and ensured that participating PLC faculty and staff (N = 181; 86 from School A and 95 from School B) received formal training from PLC Solution Consultants prior to implementation (principals at School A and B, September 4, 2018, November 3, 2018). If a PLC creates an environment conducive to student achievement and PLC performance is mediated by TCE, then the overarching question that I sought to understand in this study was the extent to which TCE can be predicted by PLC implementation when controlling for school performance.

RQ1: How do the five factors of PLC implementation predict TCE?

H_{01}: There is no significant influence on the level of TCE based on PLC factors.

H_{a1}: There is a significant influence on the level of TCE based on PLC factors.

Review of the Literature

Research articles and various works by practitioners were located through the databases of the Walden University library, including EBSCO and ERIC, along with Google Scholar. The search engines allowed me to find connected articles that used other key pieces of research work. Keywords in the search included *professional learning community*, *PLC*, *collaborative team*, *self-efficacy*, *collective efficacy*, *teacher efficacy*, and *social cognitive theory*.

Article abstracts were read for connections to current research on efficacy and PLCs. Article abstracts that matched identified research were skimmed to find appropriate content. The articles that matched the content of this study were read in totality. Articles found through ERIC and EBSCO were put into Google Scholar to find updated articles that used prior research. Walden University requires that the majority of research cited in a doctoral study is current. Publication time parameters of 2016 to the present were set to match Walden University's requirements. Bibliographies were reviewed in each of the works to ensure saturation of material.

Theoretical Foundation

Schools strive to increase student achievement. The PLC framework has become one method that schools turn to in order to increase student achievement. The strategy is to create teams of teachers who collaborate on best practices (DuFour, 2004). Within those teams, members develop collective efficacy by sharing choices and practices. During their collaborative meetings, they build trust and dependence through vicarious

and mastery experiences (Bandura, 1998). Collective efficacy helps fill the gap between framework and practice.

Bandura's Social Learning Theory

Bandura and Walters (1977) explained social learning theory in terms of the interaction between behavior and controlling conditions. According to Bandura (1997), all learning from direct experience occurs on a vicarious basis through observations of others. In the context of a PLC, teachers learn the worth of collaboration and sharing ideas by seeing the successes of their peers on a team. The emergence of individual and then collective efficacy originated from Bandura's social learning theory (Cybulski et al., 2005). Collective efficacy, as described by R. Goddard and Goddard (2001), is "the perception of teachers in a school that the faculty as a whole can organize and execute the courses of action required to have a positive effect on students" (p. 809). Furthermore, researchers collected previously established work to conclude that collective efficacy is related to student achievement. Tschannen-Moran and Hoy (1998) discovered that collective efficacy has a large effect on new teachers as they try to establish themselves in the teaching profession. The effect is significant if related to school-wide achievement, rather than being teacher or class specific (Bandura, 1999). R. Goddard and Goddard (2001) also concluded that since Bandura's social learning theory specifies perceptions of school and teaching, the same actions would be judged by the group norms set by the collective efficacy beliefs within the group. Group norms are a staple of effective collaboration within a PLC team (DuFour, 2004).

Review of Broader Problem

The two components of the literature review address the problem of efficacy and PLCs. Schools use the PLC framework to address best practices and teacher strategies. These strategies are shared during collaborative team times through teacher efficacy development. The PLC framework creates opportunities for teachers to develop collective efficacy as part of a team.

Efficacy

The foundation of the self-efficacy concept is Bandura's (1997) social learning theory. Bandura launched research to develop social learning theory and an understanding of how individuals and interacting groups form their concepts of efficacy. He explained efficacy as the belief that something can be accomplished and developed on multiple levels. His work blossomed into research on how efficacy affects teachers in the classroom and within teams by understanding how teacher efficacy and TCE are created and used to address student needs and achievement. In the sections below, I discuss the terms *self-efficacy* and *collective efficacy*, as well as the development of TCE. These components of efficacy were used in the present research to assess the correlation of PLC implementation and the development of TCE.

Self-Efficacy. Self-efficacy is the belief that desired results can be affected by the choices that people make and their ability to feel capable of completing a task successfully. Efficacy is the primary driving force of human actions (Bandura, 1998). Eun (2018) noted that self-efficacy is the largest construct within Bandura's social learning theory. A person's perceived efficacy allows them to adapt or change their

environmental conditions and is linked to the function or need of the individual (Bandura, 1998). Dewitt (2017) elaborated on Bandura's four informational sources that influence efficacy: *mastery experiences, vicarious experiences, social persuasion,* and *physiological conditions*. People can learn from personal accomplishments or mastery experiences. When a teacher tries a new method and experiences continuous success at the activity, they see a purpose behind their work. This is mastery experience, and it has the largest effect on self-efficacy (Bandura, 2000). Efficacy can be altered by vicarious experiences. This means that groups and individuals learn by watching good and bad things occurring around them. As team members, teachers watch and learn from one another. They work together to see what strategy works best for their group of students and set aside ineffective methods. Principal leadership strengthens teacher efficacy through vicarious experiences (Ross & Gray, 2006). A third method is social persuasion where members within a team convince each other to try new methods based on the success that they have experienced. The fourth is physiological conditions. This comes from the social and emotional effect of an activity.

Teacher efficacy, as described by Ross and Gray (2006), is the set of personal beliefs that refer to a specific professional performance. It is how a teacher adapts or changes teaching philosophies based on the teacher's perceived effectiveness in a classroom. Teacher efficacy is an individual construct. Cayirdag (2017) discussed the connection between teaching and efficacy as a sense of creativity. Cayirdag found that newer teachers were more apt to feel efficacy because they were not trained in teacher-led generations of schooling. Those willing to try new strategies found new successes. In

turn, teachers with strong beliefs create mastery strategies for their students and foster student cognitive development, while those with weaker beliefs and lower efficacy create classrooms that weaken students' efficacy (Tschannen-Moran & Barr, 2004). Within teacher self-efficacy, teacher perceptions of self-capability have a positive relationship to teacher behaviors that promote student achievement (R. Goddard & Goddard, 2001). This is how schools can have groups with high student achievement, but, as a whole, not meet overall standards. Collaboration may not be taught in institutions of higher learning (Y. L. Goddard et al., 2007), but they still produce individuals with high levels of belief in their abilities and strategies to reach students at all levels.

Collective Efficacy. The concept of individual efficacy gave rise to an understanding of efficacy at a collective level. Bandura (1997) defined collective efficacy as "a group's shared belief in its conjoint capabilities to organize and execute courses of action required to produce given levels of attainments" (p. 477). Self-efficacy extends to people's belief in their own role within collective efficacy to produce outcomes (Bandura, 1998). Collective efficacy is the mechanism that produces group-level goods. Collective efficacy strengthens teacher teams and teacher's comfort in various pedagogical approaches (Kunnari et al., 2018). The group's belief toward a common goal is what drives things to be done. If a group's members do not believe that they can achieve a goal and do not see how their actions can bring about change, they lose their incentive to act (Bandura, 2000). In a school setting, negative collective efficacy has been shown to be detrimental to student achievement by lowering expectations of teachers' ability to help students and teachers' expectations regarding their students' ability to

improve (Donohoo et al., 2018). Social learning theory endorses a view that even if people are knowledgeable and skillful, they will not act upon their knowledge and belief if performance disincentives exist (Eun, 2018). Collective efficacy is not a concept specific to education, but the implications within the realm of education are clear.

Collaborative learning, teaching, and development are concepts that have become paramount in education. Bandura's application of social learning theory to produce collective efficacy can be applied to teachers working together to build group efficacy or TCE. TCE, as defined by R. D. Goddard et al. (2000), is "the perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students" (p. 480). Ross and Gray (2006) noted that TCE is different from teacher efficacy because TCE refers to expectations of the effectiveness of staff whereas teacher efficacy is specific to teachers' own abilities. Collective efficacy is a group-level attribute, not based on individuals. TCE shapes the school environment and changes in teacher behavior.

Teacher Collective Efficacy. TCE is a concept that takes work and time for a school to develop, and it has been shown to have a positive connection to student achievement (Gilbert et al., 2018; R. D. Goddard et al., 2020; R. Goddard et al., 2015; Moolenaar et al., 2012; Ninkovic & Knezevic, 2018) and building personal relationships with students (Summers, et al., 2017). Like the PLC, TCE is derived from school structure (Gray & Summers, 2016). School leadership creates an environment where teachers are able to collaborate and share best practices (Donohoo et al., 2018; Goddard et al., 2015, Huguet et al., 2017). Donohoo et al. (2018) also discovered that when a team of individuals shares the belief in their ability to achieve goals through unified efforts,

they can overcome challenges, and the results they produce are more effective. TCE evolves and works best when teacher discussions on student progress and best practices are merged into one conversation (Donohoo, 2017). When present, TCE invests teachers with higher expectations and a strong focus on academics, leading to a positive approach to their personal work (Donohoo, 2018). Moreover, TCE produces a belief that the staff has a resource to turn to when faced with a problem because of the teamwork and collaboration that have been developed (Skaalvik & Skaalvik, 2019). R. Goddard et al. (2015) stated that instructional leadership and teacher collaboration are keys to developing successful TCE. R. D. Goddard et al. (2020) found TCE to have a higher connection to student achievement than student or school demographics. However, Glock and Kleen (2019) found that teacher efficacy has a general effect on teaching students rather than being specific to minority groups.

Researchers have made connections between the development of TCE and effective leadership. Similar to PLC implementation and development, leadership plays a critical role in developing TCE (R. D. Goddard et al., 2020; Tschannen-Moran & Barr, 2004). Leadership creates a learning structure that provides formal, frequent, and productive collaborative opportunities by providing a nonthreatening, evidence-based environment (Donohoo et al., 2018; Tschannen-Moran, & Barr, 2004). Voelkel (2019) and Gray and Summer (2016) found principals to be the key factor in providing structures through trust to bring change, and they are also responsible for the quality of instruction (Leithwood & Azah, 2017). DeWitt (2017) explained that principals need to be part of the collaboration as building instructional leaders. Research by R. Goddard et al. (2015)

showed a positive correlation in the development of teacher efficacy when the principal is a part of instructional leadership. The researchers also discovered that principals who worked with their staffs were more likely to create teams that shared best practice strategies. Voelkel (2019) showed that school leaders can be detrimental to teachers seeking to improve practice if they focus only on scores and not culture. Prelli (2016) noted that school and instructional leaders should emphasize modeling, create norms, work with the school community to create a common vision, and provide support to all staff when trying to develop effective schools.

Just as efficacy can drive positive change and outcomes, teachers and teams without a purpose or motivation can become stagnant or complacent in their role (Bandura, 2000). As a school builds a positive learning environment that promotes collaboration, collective efficacy develops a cycle of positive outcomes. Lee et al. (2011) found that TCE has a significant correlation in predicting teachers' commitment to students.

The efficacy of the group must relate to student achievement and differs from group to group. Researchers have found that TCE is a significant indicator of differences in student achievement (R. D. Goddard & Goddard, 2001; R. Goddard et al., 2015). High TCE removes teachers from isolation and creates group efforts to affect student achievement (Gilbert et al., 2018). Teacher collaboration is a positive, significant indicator of student achievement (R. Goddard et al., 2015). R. D. Goddard et al. (2020) found that TCE beliefs are more strongly related to student achievement than all student and school demographic variables. These researchers showed that efficacy is imperative

to reaching students and is more important than demographics or socioeconomic level. The needs of one school may differ from those of nearby schools or schools across the area. Teams must identify their students' needs. Social persuasion is the influencing factor of TCE. As a group, members keep each other aligned to common expectations and goals. Within a collaborative culture in which members share teaching strategies and ideas, group efficacy is affected through vicarious experiences as members begin to see the success of team members and student growth. All OF these pieces lead to an overall increase in student achievement (Moolenaar et al., 2012; Tschannen-Moran & Barr, 2004; Voelkel, 2019).

TCE plays an important role in teachers' development of learning strategies that have a positive effect on student achievement. R. Goddard et al. (2015) found that schools that showed higher levels of collective efficacy were 50% more effective at closing achievement gaps between their White and Black students when compared to lower efficacy schools. Kim and Seo (2018) noted that TCE positively affected student achievement even when students lack motivation. The present research assessed how TCE correlates with PLC implementation characteristics at School A.

Professional Learning Communities

The purpose of a PLC is to create a learning environment for teams of teachers to collaborate and share best practices (DuFour, 2004). Schools have turned to PLCs as a mechanism for cultural change to meet state demands for student achievement (Jaroscak, 2018). Many facets go into creating a PLC (DuFour, 2004; Hord, 2004). The components that this research focused on were the use of collaborative learning, the impact of

leadership within a PLC, and the building blocks that a PLC provides in creating TCE. This review of literature integrates what researchers have discovered that drives successful PLCs.

In 1983, *A Nation at Risk* was released by the National Commission of Excellence in Education. This document identified problems in the teaching profession, from underqualified teachers to poor training for teachers (Hord, 2004). As expected, this sparked education reform and underscored the need to address how schools approached educating youth. A similar examination and focus on teaching practices occurred with the 2001 release of the NCLB Act (Boone, 2010) and was revisited in 2015 when President Obama signed the ESSA. ESSA stresses the importance of addressing school climate and student learning.

Historically, teachers were isolated in classrooms. The teachers were placed on a proverbial island, isolated from their peers, and were left to figure out how to address their own classes.. Institutions of higher learning for aspiring teachers addressed how to work with students, but not how teachers could work with each other(Cherkowki & Schnellert, 2018). A revolution in teaching practices needed to happen.

Basics of PLCs. There is no universal definition of a PLC, just shades of interpretations in different areas (De Neve, et al., 2015; Lomos, et al., 2011; Stoll et al., 2006). For the purpose of this study, a PLC will be defined by De Neve's et al. (2015) acknowledgement of Stoll's et al. (2006) definition of a PLC to be "a school organization in which a group of teachers share and question their practice from a critical point of view. This questioning happens in an ongoing, reflective, collaborative, and inclusive

way" (p. 32). There is no debate on the effectiveness of a well-developed PLC. Research shows that PLCs result in higher student achievement (Cherkowski & Schnellert, 2018; De Neve et al., 2015; Gray et al., 2016; Lomos, et al. 2011; Stoll et al., 2006; Gilbert, et al., 2018; Voelkel & Chrispeels, 2017a, 2017b; Voelkel, 2019). Through that achievement, PLCs have become a school framework, or strategy for increasing achievement, to which districts have turned in order to address their student needs.

Professional development revolves around the school's theoretical stance and should be tied with instructional practices where concepts and tools encountered may truly be internalized and have a lasting effect (Eun, 2018). Principal in-services alone are inefficient to impacting teachers and student learning (R. D. Goddard et al., 2020). The hardest part of development is the implementation process that follows the activity (Eun, 2018). If a school desires to change to a PLC, their development philosophy needs to match the theoretical foundations of PLCs.

The origin of the PLC is debatable. An article written for Solution Tree dates the emergence of the PLC in the 1960s, gaining momentum in the early 90s, and spearheaded into modern education in 1998 by DuFour, DuFour, and Eaker with the publication of *Professional Learning Communities at Work* ("History of PLC", 2018). Wines (2019) also noted the important addition to PLCs made by researchers Stenhouse (1975), McMahon, Bolam, Abbot, and Holly (1984) and Newmann and Wehlage (1995) as contributors to the PLC framework as used in schools today.

Schools that adopt a PLC framework develop a plan to create teams that spend time addressing students' achievement (DuFour & Reason, 2016). DuFour and Eaker

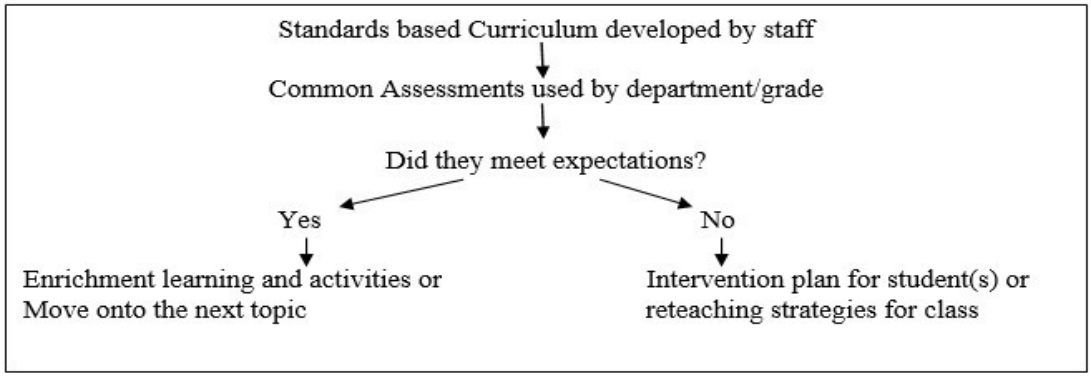
(2009a) discuss the six characteristics of a PLC: shared mission, vision and value, collective inquiry, collaborative teams, action orientation, continuous improvement, and results oriented. Hord (2004) notes five characteristics: supportive and shared leadership, shared values and vision, collective learning and application, supportive conditions, and shared practice. De Neve et al. (2015) has five characteristics: deprivatized practice, reflective dialogue, collective responsibility, shared values and vision, and self-reported changes in differentiated instructional practices. When developing a collaborative culture, even within a mutual name like PLC, differences exist in what researchers view as the key characteristics. The common theme from all researchers is sharing, thinking and learning together.

As a school integrates a PLC, the characteristics build on themselves. As a PLC, the school agrees on a shared vision. PLCs are used to address both what a student needs to learn and how to address when students do not learn (Brown, et al., 2018) The teachers work in teams to address student needs based on assessments. Teachers are divided into teams via content, grade, or department. It is common to see a teacher as a member of two or more collaborative teams. The teams focus on DuFour's three keys to a successful PLC: (a) ensure students learn, (b) build a culture of collaboration, and (c) focus on results (DuFour, 2004). The team does this by addressing four important questions to student learning as they plan their lessons. That planning involves answers to: (a) what do we expect students to learn? (b) how will we know if students are learning? (c) how do we respond if students did not learn it? (d) what do we do if students already know it? The first question comes from standards where teachers develop goals and expectations

for students. The second question determines the type of assessment teachers will use to check for understanding, which leads to the third question of developing an intervention plan for the team when students do not meet learning standards. The fourth question expands the learning opportunities for accelerated or gifted students in the class. See Figure 1.

Figure 1

Professional Learning Community Student Learning Flowchart



The teams collaborate on student progress using common student assessments and data points. They use collaborative meetings to develop instructional strategies to assist the needs of the students (Hallam, et al., 2015). At a conference for PLCs, Mattos (personal communication, July 20, 2016) addressed the issue of more things being placed on teachers' plates. He noted that "PLCs are not another thing to add to the plate; a PLC is the plate." A school that chooses to adopt this mindset and practice chooses to use the PLC framework to make all decisions. PLCs have shown a propensity for improving teaching and contributing to student learning (Hallam, et al., 2015).

Boone (2010) disclosed that ineffective collaboration and improper implementation of a PLC can lead to a hostile work environment and added higher stress levels for teachers. Lack of collaboration, administrative support and use of student data has led to poor PLC implementation (Sims & Penny, 2015) In addition, development plans that do not promote excellent teaching strategies fail at the outset and restrict teacher growth (Posnick-Goodwin, 2008). The delay in proper implementation of PLCs had schools fall behind in implementation of databased decision-making (Burns et al., 2017). Top-down decisions without taking into consideration situational and social learning threaten ownership of professional development and the impacts of programs, like a PLC (Schaap & Bruijn, 2018). Ruano et al. (2018) found that collaboration should be made at school levels, instruction-related collaboration is the most effective with teachers, what works in one school type does not work across all levels and buildings. School leadership needs to find what works in their school. Preast and Burns (2019) argue to avoid these pitfalls districts and schools should hire consultation services, especially if addressing multiple schools and leadership within the same district. This method allows for all to get the same message and same plan of action.

Researchers have discovered that development of effective PLC culture requires trust, shared leadership, supportive conditions, and positive relationship building (Bolam et al., 2015, Gray & Summers, 2015; Hallam et al., 2015; Jaroscak, 2019; Kohl 2014; Voelkel & Chrispeels, 2019; Voelkel & Chrispeels, 2017a). Stewart (2017) established in her research of secondary school teachers' perceptions of PLCs that collaboration, time, shared responsibility, and focus on learning and results were the keys to developing an

effective PLC culture. Zonoubi, et al. (2017) researched pre and post PLC schools. They found teachers before the PLC desired a need for instructional skills and strategies. The teachers' efficacy after the implementation of the PLC led to more innovative teaching strategies. All these lead to a change in the education of students. The theorists Dewey and Vygotsky both share similar views on using education reform and teaching practices to affect student change.

The Root of PLCs. John Dewey's progressive education theory and Vygotskys' social constructivism provided theoretical foundations in the development of PLCs. The Progressive Education Theory was a contrast to traditional education methods of teaching students (Dewey, 1929), while Social Constructivism showed that social interactions and individual meaning play key roles in learning (Bozkurt, 2017). Dewey (1929) believed that schools needed to use more than just teachers lecturing content, but should focus on the whole child (Radu, 2011). In order to reach the whole student, the student must be acquainted with the work of the community, history, economics, and occupations (New Learning, n.d). This notion applies to teacher and team learning, too. Tohill (2009) expresses the importance of creating development plans for teachers that will continue to improve teaching quality for today's changing student. The development must take into consideration the needs of the school, community and the students.

A school must be careful in labeling itself a PLC without changing the school culture. Schilling (2016) states that PLCs serve as tools to becoming highly effective schools, but they are not a solution if not implemented correctly. They are a cultural shift in a school ideology through enhanced collaboration and shared leadership. Establishing

a PLC has been shown to be one of the most powerful forms of staff development for teachers (East, 2015). If the goal of a school is to develop teachers who understand how to reach their students and increase test scores, the cultural shift has to begin at the crossroads of the theories of Dewey and Vygotsky and the concept of the PLC. As noted by Mattos, a PLC is the plate on which all other incentives and schools demands rest. The PLC addresses how each component works within the realm of the school. A PLC integrates research that supports what teachers should do and transforms it into action in the classroom. The theorist laid the groundwork for educating students and working together. A PLC weaves these two theories together to train schools how using teams of teachers to collaborate can address student achievement.

Dewey and Vygotsky. The primary foundation of progressive education theory is based on the idea that people work together to solve problems (Dewey, 1929). That foundation builds the collaborative nature of successful PLCs through collective efficacy. East (2015) also established social constructivism by Vygotsky as a step in the framework for successful PLC work by noting that social constructivism "encourages teachers to work together to analyze information and construct new meaning to solve problems in classrooms, schools, and eventually in society" (p. 16). Glassman (2001) notes similarities between the two theorists and how their work pushes educators to think about the role of the activities they do in their classroom.

In a PLC, the teacher is no longer a lone producer and strategist of information. They have become facilitators that collaborate with other teachers to address student understanding and meaning by departments, grades, or content areas. Knowledge is

gained through shared experiences and interactions, rather than individual experiences (Lynch, 2016). This approach to learning applies to both students and adults. If the goal is to reach the most students in a classroom, teachers have to work together to develop pedagogical approaches that focus on Dewey's ideas related to learning by doing. Vygotsky's work proposes the need for someone to create activities that lead the child toward mastery (Glassman, 2001). These two ideas are very close. However, it should be noted that Dewey suggests the mastery of a concept is by doing an activity, where Vygotsky suggests someone show the student how to do the activity. One theory has the teacher as a facilitator and the other as a mentor. Based on the key components of a successful PLC, both methods can be used by teachers to ensure students learn as long as the decision was made within the collaborative team and is based on student results (DuFour & Eaker, 2009b).

There has been significant research done on developments of PLCs and there are companies that specialize in the steps to implementing a PLC in a school. The research suggests that high efficacy can produce highly effective PLCs (Voelkel & Chrispeels, 2017a) and PLCs are associated with positive TE (Voelkel, 2019).

Implications

The implications of this study are to contribute to the current literature on PLC and TCE, as well as address the gap in practice at a local junior high by assessing whether their PLC implementation has hindered the development of TCE through a professional development plan. This research will explore the factors of PLC

implementation and TCE to determine variance at School A, compared to School B, as factors in student achievement.

Based on survey results, the research will result in a professional development project for the factors of PLC that have the highest variance on TCE. If the data supports a lack of proper implementation categories within the school, the project will focus on those specific PLC implementation aspects. The project will rework the implementation and connect the need for proper training to aspects of teacher efficacy. If the data shows PLC implementation is not the concern in the development of TCE, the project will address the areas with low results within TCE to help bridge the gap between PLC framework and TCE. Either of these possible projects will create a learning environment to aide student achievement.

Summary

Section 1 showed the importance of PLCs and TCE in a school setting. The section addressed the gap in practice at a local junior high and how addressing the low student achievement has a positive social change. The introduction to the study, the background of the study, the statement of the problem that was addressed by the study at both the local level and within literature all show that a study is warranted to address a social need supported by research. The purpose of the study to address a gap in practice, the research question, hypothesis, and null hypothesis that guided the study were explained within section one. The theoretical framework based on Bandura's social learning theory informed the study and the need to develop TCE. The work of both Dewey's Progressive Education Theory and Vygotsky's Social Constructivism Theory

provided rationale to schools adopting a PLC and developing TCE as ways to address student achievement.

Section 2: The Methodology

Research Design and Approach

The study's research question was assessed using a quantitative multiple linear regression test. The research question focused on the five characteristics of the PLC framework, which were the independent variables, and variance of these characteristics on TCE, which was the dependent variable. A dummy variable was used to differentiate School A and School B by performance or other factors that may have caused differences in TCE. With the permission of the superintendents and principals, teachers and administrators at Schools A and B took the PLCA—Revised and the CTES survey. The surveys were combined into a single-entry survey to be respondent friendly. The survey creators granted permission for the surveys' use. The surveys were not used for proprietary purposes. The use of these surveys aligned to the research question for their assessment of teachers' perceptions of PLC and TCE.

The research question was addressed using a multiple linear regression test. The five factors of PLCs were assessed with the PLCA—Revised survey. TCE was assessed by the CTES survey. The assessments were combined into a single Google Form and administered using World Wide Web technology to both School A and School B. Using the survey results, a multiple linear regression test sought to understand which PLC characteristic's mean scores accounted for the most variance on the mean score of TCE. The addition of a dummy variable accounted for possible performance differences in the schools.

Setting and Sample

The participants in this study were all professional educators who had been involved in the PLC implementation at School A and B. The participants were all stakeholders who had worked or had impact on student learning within the school. The principals allowed me to be available after school during a staff meeting to address the consent form. Due to Covid-19, a Zoom link was made available for those who preferred to meet remotely. I discussed the purpose of the survey, how the data would be used, and the plan to provide a professional development project that would be designed based on the results of my data analysis and findings. After the meeting, the building administrators sent the survey link to their staff. The volunteers ($N = 103$) completed the survey on their own time.

The years of service for the participants ranged from 1 year to 25 years. The staff at School A were 85% White, 8% Black, and 3% Hispanic, with 4% identifying as other demographics. At the school, 100% of the teachers received excellent or proficient ratings on their evaluations. The staff at School B were 84% White, 7% Black, and 2.5% Hispanic, with 6.5% reporting as other demographics. At the school, 95% of teachers had excellent or proficient ratings on their evaluations (Illinois Report Card, 2019).

The anonymous data collected were shared with the school's building-level principals upon acceptance of the study by Walden University. This same data are found within the study in Appendix C for School A and Appendix D for School B. The principals may use the data to address their school's PLC framework and aid in creating TCE. I will remain available to the administrative team for continued correspondence.

A power analysis to assess the necessary sample size was performed using G*Power software to produce a required sample size for a multiple linear regression test. A *p*-value > .05, an error value of .05, and a power of .95 require a sample size of 89. This assessment included the five independent variables, plus a moderation (dummy) variable to account for impact on TCE not attributed to PLC. School A had 86 staff members who were asked to volunteer to take the survey, and School B had 95 staff members who were asked to volunteer to take the survey. School A's participants completed 51 surveys, with one person not consenting to their data being used. That participant's data were removed from the data set. School B's participants completed 53 surveys. A total of 103 surveys were completed.

Instrumentation and Materials

The rights to the PLCA—Revised are owned by PLC Associates. Oliver (2010) provided the rights to the survey on May 24, 2020 (Appendix B). The survey validation accompanied the rights of use (Olivier, 2003; Olivier & Hipp, 2010). The 52-question survey assesses the perceptions of teachers on the five dimensions of a PLC after its implementation. The five independent variables representing PLC were shared leadership (SL), shared vision and values (SVV), shared personal practice (SPP), supportive conditions (SC), and collective learning and application (CLA).The survey used multiple questions to assess the mean value of a variable. For instance, Questions 1-11 assessed the participant's perspective of shared and supportive leadership. The 11 answers were averaged for that participant to give them a mean score for shared and supportive

leadership (SSL). This mean score was used within SPSS as the participant's score on SSL. The same method was used for the other four PLC variables.

R. D. Goddard et al. (2000) provided rights to the use of the CTES survey on March 3, 2020 (Appendix B). McCoach and Colbert (2010) confirmed the validity of the survey. Further research into the validity of the survey found that the CTES survey was useful to inform leadership practices to instill a greater sense of collective efficacy among staff (Donohoo et al., 2020). The survey results are displayed for School A in Appendix C and School B in Appendix D. The 21-question survey assessed the perceptions of teacher efficacy by all professional staff who had a cooperating role in the education of students. The survey used multiple questions to assess the mean value of collective efficacy. The 21 answers were averaged for each participant to give them a mean score for TCE. This mean score was used within SPSS as the participant's score on TCE. SPSS software was used for the multiple linear regression to assess which, if any, mean variable scores of PLC had variance on the mean TCE scores.

Assessment results for PLC and TCE variance data are displayed in table form at the end of Section 2. As described below, the principals from each school provided the survey link to their respective candidates for accessing the survey instrument online using a Google form. The participant clicked on the link. The survey asked if they consented to their data being used. If they clicked no, the survey closed. If they clicked yes, the survey was unlocked for their completion. The participants were given a 2-week window to complete the survey. The data were then downloaded, and mean scores of variables were created for use in the SPSS software.

Data Collection and Analysis

Participation in the research was voluntary. The junior high and middle school principals agreed to allow me to provide the survey link to the administration for dissemination. The administrators shared the survey link through email. At a staff meeting, I discussed the survey, including the plan to maintain anonymity and confidentiality of the individual results. Personal identifiers (names, emails, grades, etc.) were not associated with the individual surveys, and the schools were given separate pseudonyms for the research.

The data were collected using Google Forms. The form included both the PLCA—Revised and CTES surveys. These forms are found in Appendix B. The scores were collected on a Likert scale via a multiple-choice survey that ranged from 1 (*strongly disagree*) to 4 (*strongly agree*). The multiple linear regression analysis was completed using SPSS. A standard p-value < .05 for rejection of the null hypothesis was used. PLC characteristics were the independent variable, and TCE was the dependent variable. Through a multiple linear regression test, I sought to understand whether variance of TCE can be attributed to the five characteristics of a PLC. A moderating (dummy) variable was added to address additional influences on TCE not attributed to PLC implementation for School A and School B. A moderating variable was used to ascertain whether another variable or set of variables was interacting with the dependent variable to impact outcome (Fairchild & McQuillin, 2010). In this study, the moderating variable of school was used instead of a student achievement measure because no state test was given in the spring of 2020.

Correlation between the independent variables was assessed to avoid multicollinearity as well as independent correlations between the independent variables and dependent variable to avoid overfitting the regression tests (Frost, 2017). The independent variables were run to assess what variable(s) of PLC implementation had the largest variance and impact on TCE. The multiple linear regression test was used to understand how PLC factors were influencing the collective efficacy of teachers at both schools. The dummy variable was included to assess influences not included in PLC implementation in each school.

Assumptions, Limitations, Scope and Delimitations

There were assumptions with regard to the data in this study. First, it was assumed the administration and staff had been trained via onsite or through correspondence training on a successful PLC framework. It was assumed that the school was organized into department or grade-level teams as mandated by school leadership and that the participants in this study were aware of the PLC initiative. It was assumed that the participants read the consent form before taking part in the survey. It was assumed that each participant responded to the survey items thoughtfully and honestly. Finally, it was assumed that the results, when provided to the administration of each building, would be used for professional development and not against staff.

In this study, I used a multiple linear regression test to analyze the relationships between the variables. In the use of a linear regression, it is assumed that the relationship between the variables is linear, the variance is the same for any value of the independent variable, no multicollinearity exists, and for any fixed value of the independent variable,

the dependent is normally distributed. In a moderation model, it is also assumed that homoscedascity, variance that remains after predicting the dependent from independent factors, is constant across values.

The study was limited to the availability and the size of the school. Another limitation was the homogeneous sampling of administrators, teachers, and instructional aides at the school building who were asked to participate in the study. The schools in this research had 181 staff members. For this research, the superintendents and principals provided approval for me to attend a staff meeting to discuss the survey and its purpose. The study was reliant on people consenting and being able to take the survey. The survey was 73 questions long and took between 30 and 35 minutes to complete.

The scope of this study covered the professional junior high school staff at School A and School B. Participants had the capability to score how they perceived the PLC characteristics in their school and the collective efficacy of their staff. I used the participant results to identify the five PLC characteristics, which represent the independent variables for the study, and the development of TCE, the dependent variable for the study. This study was delimited by surveying the professional staff of School A and School B identified for participation and those who chose to complete the survey. The study was also delimited by only focusing on PLC as a cause of TCE. The dummy variable delimited the study by only focusing on general school performance, not specific differences in school performance.

Protection of Participants' Rights

Permission was sought and granted from the district's superintendents prior to the research being conducted. Once Walden's Institutional Review Board (IRB) granted permission, participants were invited to take part in the study. A consent form was sent prior to the staff meeting describing the purpose and expectations of the study. The consent form was available at the informational meeting. It stated that participation in the survey was voluntary and had no bearing on participants' professional evaluations. The survey was sent through a Google survey link to professional email accounts provided by the school district. The email noted that by clicking on the link, participants consented to their data being collected and used for research. The participants filled out and submitted the combined survey.

Confidentiality and anonymity of subjects are extremely important when considering participant rights. The American Psychological Association (APA, 2010) noted two methods of protecting subjects. The first option is to prepare case material, present a report, and obtain written consent for publication. The second option is to disguise some aspects of the case material. In this study, I used both options. Participants were made aware of the study by reading a consent form. The schools' and participants' identities were protected. All documents that produced data to be analyzed were deidentified, and the participating schools' identities were protected using pseudonyms and redaction, where necessary, in the final study. The data were collected and have been stored in a password-protected computer and password-protected drive, which will be stored in my home safe for the required 5 years.

Data Analysis Results

Staff at the two schools completed a total of 103 surveys to assess the research question "How do five factors of PLC implementation and the school type impact TCE?" School A's participants completed 51 surveys, with one person not consenting to their data being used; that participant's data were removed from the data set. School B's participants completed 53 surveys. The 103 completed surveys were used for analysis in assessing variance through linear regressions. The SPSS program was used to run all data analyses in this study. The program's multiple regression test produced a model summary with an *r*-squared value, an ANOVA test for significance, and a coefficient table to show significance of each variable in the regression.

Prior to the linear regression, correlations within the independent variables were run to check for multicollinearity, and between the dependent variable for each group to avoid overfitting, an outcome when independent variables are correlated to the dependent variable (Frost, 2017). The five independent variables representing PLC were shared leadership (SL), shared vision and values (SVV), shared personal practice (SPP), supportive conditions (SC), and collective learning and application (CLA). The dependent variable was TCE.

Correlations close to $r = 1$ show a strong positive linear relationship between two variables. Values higher than $r = .7$ or .8 suggest the possibility of a multicollinearity. In this study, all values fell between $r = .660$ and $r = .923$, suggesting the need for further investigation into the possibility of multicollinearity. A test for variance inflation factor (VIF) was used to assess values greater than 1 and less than 10 to identify

multicollinearity. VIF is an inflation measurement of variance of a regression coefficient due to multicollinearity (Glen, n.d.). Those variables outside the range were combined with the other independent variables. It was discovered that the CLA had high correlation to SPP (r = .923, VIP = 12.713), and therefore CLA was removed to avoid multicollinearity. The four remaining independent variables were utilized in the linear regression model to account for variance in the dependent variable.

Table 2 shows the model summary for the multiple linear regression, including the r-squared value for the variance of the regression. According to the model summary table, 68.8% of the variance in the collective efficacy variable was accounted for by the four independent variables used in the analysis. The more conservative adjusted R^2 represents a mathematical correction for the positively biased estimate of R (Laerd Statistics, 2021). In this case, the more conservative R^2 = 67.2 is still considered a large effect, according to Cohen (1998).

Table 2

R-Squared Adjusted for Model

Model	*R*	*R* squared	Adjusted *R* square	Std. error of the estimate	Durbin-Watson
1	.829[a]	.688	.672	.25008	1.694

[a] Predictors: (Constant), School, SPP, SL, SC, SVV.

Table 3 shows the f-value statistic resulting from the multiple linear regression of the PLC variables to TCE, including the significance of the variables within the regression model. The ANOVA test was significant, with $p < .001$. The table provides evidence of significance for the use of the multiple linear regression model.

Table 3

F Test and Significance for Regression

Model	Sum of squares	*df*	Mean square	*F*	Sig
Regression	13.359	5	2.672	42.722	.000
Residual	6.067	97	.063		
Total	19.426	102			

Table 4 shows the independent results of each variable within the regression model. The two variables that were significant for developing TCE were SVV ($p = .020$) and SC ($p = .000$). Therefore, I rejected the null hypothesis of no significant prediction because there are factors within PLC that show significant variance on TCE where $p < .05$.

Table 4 also shows two other important pieces of information. First, the variables SL and SPP were not significant at $p = .568$ and $p = 783$, respectively. Therefore, neither of these independent variables significantly predicted TCE within the regression model. In order to assess if the school had significant variance of the development of TCE, a dummy variable value of 1 was set for School A and 0 for School B. This indicator assessed whether the schools themselves were mediating factors in TCE based on PLC factors. The dummy variable (school) was not significant ($p = .434$). Therefore, it was determined that the school itself did not significantly predict TCE.

Table 4

Significant Values of Independent Variables on Teacher Collective Efficacy

	Unstandardized coefficients		Standardized coefficients			Collinearity statistics	
Model	*B*	Std. error	Beta	*t*	Sig.	Tolerance	VIF
Constant	1.205	.153		7.891	.000		
SL	.046	.080	.071	.573	.568	.209	4.744
SVV	.219	.093	.329	2.363	.020	.166	6.014
SPP	-.019	.067	-.027	-.276	.783	.326	3.066
SC	.317	.087	.447	3.625	.000	.211	4.730
School	.052	.067	.060	.786	.434	.550	1.820

Note. Variables are significant for $p <. 05$ in the regression model.

Statistically significant regression coefficients can also be used to formulate a model equation that can then be used to predict new levels of the dependent variable given specific levels of the independent variable(s). The theoretical representation of a regression model with two significant predictors can be written as

$$Y = ß_0 + ß_1X_1 + ß_2X_2 + e$$

where Y is the dependent variable (TCE); $ß_0$ is the slope intercept, also known as the constant; $ß_1$ is the slope parameter (i.e., coefficient) for the first significant variable, X_1; $ß_2$ is the slope parameter for the second significant variable, X_2; and e is the sample error (Laerd Statistics, 2021). Because the dummy variable was not significant, I dropped the "e" from the formula (the school sample proper had no statistically significant effect) and wrote the prediction equation using the significant coefficients in Table 4, as:

$$\text{Predicted TCE} = 1.205 + (0.219 * \text{SVV}) + (0.317 * \text{SC})$$

Finally, the significant coefficients may be interpreted that for every single unit increase in SVV as measured by the PLCA-R, TCE will increase approximately .22 as measured

by the CTES. Likewise, for every single unit increase in SC, TCE will increase by .32. Together, therefore, these two PLC characteristics have significant potential for increasing TCE if they can be developed authentically and with fidelity through professional development training.

In summary, a conclusion drawn from my data analysis revealed that shared vision and values along with supportive conditions are important factors for developing TCE at two schools that implemented PLCs in 2016. Therefore, I also concluded that professional development targeting the two PLC variables of shared vision and values and supportive conditions could justifiably be addressed through a professional development project study. By training in the two areas represented by these variables, my data analysis supports the potential to increase TCE. By extension, it is hoped that improving TCE by focusing on the development of significant PLC characteristics for predicting TCE will also improve student achievement at both schools, a conclusion that has been supported by other research (R. Goddard et al., 2015; Voelkel, 2019; Voelkel & Chrispeels, 2017a).

Section 3: The Project

Introduction

The problem for this study was that two neighboring junior high schools in Midwestern school districts implemented PLCs during the 2015-2016 school year to improve student achievement on state-mandated tests and achieved very different results. The purpose of this study was to determine the moderating effect that school performance has on the association between PLC implementation and TCE. The multiple regression test performed on the data collected showed statistically significant variance on efficacy through the development of shared vision and values and supportive conditions.

This project study focused on professional development using current research (Allen et al., 2018; Ankel & Englander, 2018; Gray & Summers, 2016; Kirkpatrick, 2017; Willis & Templeton, 2017) to build shared vision and values and supportive conditions for their PLCs to aid in the development of TCE. The project consisted of 2 days in the beginning of the school year to address the vision and values on Day 1 and supportive conditions on Day 2. The third day completed at the end of the semester to assess the progress of the two development days, celebrate successes, and address areas for continued improvement. The staff retook the survey. The data were collected and assessed by me to seek an increase in mean scores for the two independent variables, shared vision and values and supportive conditions, and the dependent variable, TCE.

Rationale

The purpose of this study was to examine whether a relationship existed between PLC implementation and TCE development mediated by the school. The multiple linear

regression test showed that the variables of shared vision and values and supportive conditions were significant in TCE development in these two schools. Moreover, the dummy variable as a mediating factor in the regression analysis showed that other factors of the two schools were not significant. This allowed the project's focus to be a professional development plan addressing these two PLC variables to improve TCE conditions and not mediating factors at each school.

Review of the Literature

The literature review addresses the development of the variables of supportive conditions and shared vision and values in a PLC. The terms *supportive conditions*, *relational conditions*, *structural conditions*, *vision statement*, *values*, and *shared vision and values* were searched using Google Scholar and the Walden Library's search engines ERIC and EBSCO.

The process of PLC implementation can be viewed in three phases (Ghani et al., 2020) or stages (Balasi & Iordanidis, 2019). Ghani et al. (2020) included shared vision and values in the initial phase and supportive conditions in the second or support stage. Both must be in place before a school can transition to the third phase, called the *sustain phase*. Researchers have discovered that development of effective PLC culture requires trust, supportive conditions, and positive relationship building (Allen et al., 2018; Bolam et al., 2015; Gray & Summer, 2015; Hallam et al., 2015; Kirkpatrick, 2017; Kohl, 2014). Cansoy and Parlar (2018) laid out the connection of these two variables with school leadership providing the supportive conditions for collaboration and shared leadership, while teachers adopt the vision and values to improve student learning at school.

Shared Vision and Values

Vision

Vision statements can be found in nearly all schools and districts. Often, they are the first thing addressed by new boards and superintendents. Kirkpatrick (2017) defined a vision as "the positive impact that the organization wants to have; a vision statement is a formal description of the organization's desired, long-term future state" (p. 7). From the outside, a vision statement provides valuable information on where the school and community see themselves heading (Allen et al., 2018). DuFour and Eaker (2009b) noted that a vision instills a school with a direction. A shared vision motivates, energizes, creates proactivity, establishes standards of excellence, and creates a clear agenda for action. Moreover, an effective vision creates a clear picture of the school's future. A shared vision is also essential for effective communication (Law & Breznik, 2018; Thornton & Cherrington, 2019) and organizational planning (Allen et al., 2018). These researchers all expressed the importance of a shared vision statement for a school to have an effective PLC. Important factors of shared vision include motivating and energizing people, creating a proactive orientation, giving direction to people within the organization, establishing specific standards of excellence, and creating a clear agenda for action (DuFour & Eaker, 2009a). The vision is the battle cry of the district that directs the PLC. The data in this project support addressing the vision and values of the schools to effect change in TCE.

When addressing the shortcomings of a school, an analysis of the vision statement is required to address gaps in alignment and identify solutions for future action (DuFour

& Eaker, 2009; Kirkpatrick, 2017;. DuFour and Eaker (2009b) agreed on six guidelines for an effective vision statement from Kotter (1996). According to Kotter's guidelines, a vision statement should be imaginable, desirable, feasible, focused, flexible, and communicable. If the current vision does not express the direction of the school and PLC, then a new vision statement, with input from stakeholders, needs to be developed.

Developing a new vision statement is required if the existing vision statement does not match what the school envisions for the future. In a PLC, the vision should shape staff's beliefs that students are academically capable, that each student has potential to achieve, and that staff will create a learning environment that supports student growth (Hord, 2004). Ankel and Englander (2018) explained that developing a shared vision is the most important step in leading change. Teachers need to feel valued and to understand the point of their effort before they accept a vision (Willis & Templeton, 2017). A shared vision is not just words on a wall, but an agreement made by stakeholders for the direction of the school and district that they believe is best for the students and their learning (Thomas, 2018). The vision of the school should include key components of a PLC, which include, but are not limited to, collaboration, student-centeredness, trust, and shared leadership (Stoll et al., 2018).

DuFour and Eaker (2009a) provided schools a plan for creating a new vision statement. These steps have been the cornerstone of other research on PLCs (Courtney et al., 2017; Mombourquette, 2017; Wan, 2020; Wines, 2019). A vision statement must be created in collaboration with stakeholders to promote widespread ownership. The statement should be based on background information, desirability, feasibility, and

credibility. It must clarify a focused direction and be easily communicated. As part of this project study, the school will create a team of stakeholders, including but not limited to teachers, administrators, community members, aides, and students, to review the school's current vision statement. If the team does not believe that it reflects the goals and direction of the school, a new vision statement will be created through this group addressing the components put forth by DuFour and Eaker (2009b).

Values

Vision and values are not interchangeable words, but linked concepts. Kirkpatrick (2017) defined values as "ideas that are important and that the organization seeks to retain; they define the means or behaviors by which the organization will go about attaining its vision" (p. 7). The values are why a school believes in its vision (Keefe, n.d.). Values serve as the guiding principles in developing a vision for a brighter future (Martin et al., 2018), provide the vision's answers to the purpose of education and programs selected by the school (Allen et al., 2018), and determine how staff will spend their time to increase student achievement (Hord, 2004). DuFour and Eaker (2009) noted that schools should not be content just to describe the future (vision); they should promote shared values intended to promote and protect the school's vision. The education and well-being of each student are of paramount importance within the values of a school.

The project study will incorporate the values of the school after the vision statement has been created. The team of stakeholders decided what values guide the teachers and students toward the vision. As suggested by DuFour and Eaker (2009), the

team created “We will use PLCs to …” statements to guide their practices. These statements, generated by the stakeholders, created common expectations and align multiple perspectives into a single goal. Values and goals that emphasize learning, accountability, improved teaching, and teamwork are the cornerstone of PLC collaboration (Bergeron & Network, 2020). The outcome of the stakeholder meeting resulted in the assessment of the current vision statement. If a new vision was required, the team decided on a new vision for the school. In either situation, the second step was to take the vision statement, new or current, and create a set of values listed as “We will use PLCs to …” statements that will expressed the shared values of the stakeholders and create common goals in teaching students.

The “We will use PLCs to…” statements led to the development of specific, measurable, achievable, relevant, and time-based (SMART) goals for each grade, department, and team. Goals are the fourth building block in developing vision and values in a PLC (Dufour & Eaker, 2009a). Goals allow teams to assess their progress toward achieving the school’s vision and are essential to sustaining the momentum of any initiative (DuFour & DuFour, 2013). In this study, the overall evaluation of the vision and values of the schools involved assessment of the mean score of the participants on Questions 12-20 on the PLCA—Revised survey.

Supportive Conditions

Supportive conditions constituted one of the five variables of a PLC assessed in this study. Questions 38-52 on the PLCA—Revised survey assessed the schools’ perceived supportive conditions. There are two parts associated with supportive

conditions: relational conditions and structural conditions (Teague & Anfara, 2012). Collaboration is not an invitational event. It takes work to build the time, roles, trust, relationships, mindset, and efficacy of teams. Each component of relational and structural conditions plays an important part in developing supportive conditions within a PLC.

Relational Conditions

These conditions, also called *human capacities* by Hord (2004), are the parts of teaching where colleagues develop relationships through trust, supportive roles, interdependency, and collective efficacy. Moreover, Poore (2018) connected relational conditions between Kruse et al. (1994), Leo and Cowan (2000), and Hord (2015), showing that trust is the key factor within all conditions for a PLC to run smoothly. Willis and Templeton (2017) discovered that teacher buy-in to a PLC framework and trust went together. If teachers do not see a reason for or have a stake in the change, teachers will find PLCs to be just another acronym that their administration is presenting that will go away like all the others. Gray and Summers (2016) showed that effective PLCs have common characteristics of collaboration and supportive structures; however, structures are not enough for a PLC to thrive. Open and trusting relationships must be built between teachers, colleagues, and leadership. Cherkowski and Schnellert (2018) and Thornton and Cherrington (2019) found common time to be the most difficult obstacle, but once that was in place, it allowed for a cycle of action and reflection to build solid team collaboration.

Psychological Safety. As noted, trust is the largest part of building relational conditions. Edmondson and Lei (2014) and Edmondson et al. (2004) added the concept

of psychological safety in developing positive working climates within teams. This is the individual's perception of consequences for taking risks, asking questions, seeking feedback, or reporting a mistake. In addition, a psychologically safe environment allows teachers to engage in self-correcting action because they do not fear that their actions will result in punishment (Turner & Harder, 2018). The difference between the two concepts is that trust focuses on the subject giving others the benefit of the doubt and psychological safety occurs when the subject believes that others will give them the same benefit. For instance, a teacher may trust a group to be supportive of them when they failed at a lesson, but psychological safety may stop them from opening up about the lesson because of personal fear of retaliation from admitting failure. Nonthreatening environments have been shown to encourage risk taking and alternative thinking (Kleine et al., 2019). Edmondson et al. (2004) concluded that to build an organization of psychological safety, leaders must focus on creating organizations that allow for failure and learning.

Building a support structure and teacher buy-in was a focus of this variable. The first step was having community and school stakeholders, including teachers, as part of the vision and values step. This initial involvement allowed voices to be heard and promote a common system where the teachers and administration share a plan. A shared plan creates buy-in. The next step is to have the administration create times to celebrate and recognize the work of staff and students. Celebration is a large part of the PLC process (DuFour & Eaker, 2005; Linton, 2017). Holden et al. (2021) suggested using celebrations to honor and review the year's progress and discuss how to make

improvements for the following year. Celebrations set a clear link between the recognition of work done and reinforcement of the commitment that the team is attempting to achieve (DuFour & DuFour, 2013). Celebrations show staff their value in the PLC process and key involvement in the continuous discussion of how to make learning better for all students at their school.

There is a significant parallel between relational conditions and the transistion between individual teacher efficacy and TCE. In isolation, teachers may create their own plans and teaching strategies, but without teams in place, they cannot develop their strategies from working with other teachers who have seen success. Recall Dewitt's (2017) four informational sources for developing efficacy: mastery experiences (teachers learn it themselves), vicarious experiences (teachers see the success of their peers), social persuasion (teachers are reliant on each other for consistency), and physiological conditions (teachers are emotionally or socially attached to the activity). Cherkowski and Schnellert (2018) found that it takes time to develop a culture of support to make lesson plans that are carried out, reflected on, and adjusted. These changes occur over time through team meetings that provide judgement-free observations and suggestions with a focus on student achievement.

Structural Conditions

Hord (2004) stated that structural conditions are the physical features that enable a PLC's success. This includes time to meet, proximity of common groups or teams, size of the school, availability of resources, and the school's schedule. If school leaders expect to create positive relational conditions, teachers need the opportunity to meet and

collaborate, develop strategies, and share best practices within a PLC to increase student achievement (Gray & Summers, 2016; Hallam et al., 2015; Kohl, 2014; Terry et al., 2018). Once those pieces are in place, the meetings are then set up in a manner for structural consistency, including an agenda for each meeting with goals for the team and assigned roles of the participants.

In a discussion with the principal of each school in this study (January 21, 2021; January 22, 2021), it appeared that the structural conditions for collaborative meeting times existed in each grade and department in both schools. The schools were broken down into communities by grade. Each day, the teachers were provided a personal plan period and a PLC collaboration period. Three days a week, they met with their grade-level team (A or B). During the other two days each week, they met with their grade-level department team. There was not a time during the week for the departments across grade levels to meet; however, the principals did note that they had a school improvement day each month where that collaboration occurred.

The structural conditions for the project study do not appear to be an issue, but as part of the process, the principal will meet with their leadership teams from each grade and department to address any scheduling concerns from the staff or the structural setting of the building. The principal's role is the foundation of a successful PLC through communication of the vision, guidance and support of its intent, and creating conditions that allow collaboration to happen (Johnson & Voelkel, 2019). The team leaders will lead discussions within their groups to create group SMART goals aligned with the vision and values created by the stakeholder group. One goal would be quarter based, one goal

semester based, and the third year based. The teams will define how the goals are assessed, but the semester and year goal can be assessed through the school benchmarking and state assessments.

Project Description

The project will be a three-day development plan. The school starts the year off with two institute days. The first institute day begins with a district meeting involving all five buildings. In the afternoon, building specific development begins. The first part of the plan will be held in the morning of the first day of institute after the district leadership has addressed the staff. The second day will include all day meetings to address supportive conditions in teams. An additional school improvement day will be used in December prior to break to complete the third day of development.

A suggestion will be given to the school to use the same plan for improvement days in December and May. At the third improvement day, the PLCA-Revised and TCE surveys will be given to staff to assess the new implementation process. It should be noted that if the school would like to use the same questions as presented in this study, they will need to purchase the rights to the PLCA-Revised from Solution Tree. That contact information will be given to the school's principal.

Prior to the first institute day, the principal will reach out to the leadership of the school and community to create a vision committee. This committee will gather on the first institute day. The first development will start with a review of the current vision statement. If revision is required, the team of stakeholders will create a new vision statement to align with the direction of the school. The second institute day will be used

to unveil the school's vision statement with input from all stakeholders. The team will discuss with the staff the vision statement and express what values the team used to create the vision statement. Next, the leadership team will create "We will as a PLC…" statements for the school. The team will show the staff how to create the statements to align with the vision statement. This exercise will provide the staff guidance for the rest of the day's activities. The staff will then meet as grade level teams to create grade level "We will as a PLC…" statements and as departments to create similar statements. The third day will be at the end of the semester to review the statements, goals, celebrate achievements, and address what still needs addressed next semester.

Project Evaluation Plan

There are multiple levels of evaluations. The formal evaluation by the school's growth of the two variables will be assessed on the PLCA-Revised and TCE surveys. The survey completed by the schools shows the scores of the school prior to the development plan. The school will be provided this baseline data as part of the project. The survey can be found in Appendix C. After the semester is completed, the school will take the survey questions again to reassess their standing within the two significant variables and TCE. A recommendation will be made to complete the survey questions for supportive conditions, shared vision and values, and TCE one more time in May to see if a year of implementation has made a difference to the school's scores.

The secondary evaluation is a continuous assessment done by the teams of their SMART goals. The principal will meet with the team leaders as formal check-ins on the teams' progress toward their quarter, semester, and yearlong goal. As part of the agenda,

there will be a standing item for reflection of student lessons. Two questions will appear on the agenda and are the focus of all team and department meetings: “What is it we want our students to learn?” and “How will we know when each student has learned it?” (DuFour & DuFour, 2013; DuFour & Eaker, 2005). These questions will be the root of all discussions during their team meetings through the scope of the goals. Throughout the semester, the principal will observe the team meetings to assess psychological safety and ensure teams are following agreed roles and norms.

Project Implications

The purpose of the development is to address the two PLC variables that have the highest variance on TCE. Once the two PLC variables are addressed, I hypothesize that TCE should increase, which should influence student achievement. The steps in this project create a system with a shared vision and value by the stakeholders. The implementation has the support of staff because they were part of creating a plan for the future of their school. The staff then spends time developing a plan on how to achieve the vision through collaboration in department and grade level teams. The unified voices aligned to a common goal should increase the TCE of schools.

The school is a staple in any community. Inclusion of the local leaders and stakeholders gives them a voice in the direction of the school and their students. This provides community buy-in and support toward the vision of the school. This also allows for information to be passed along easier to the community and opens access to more community resources that had a voice in the development of the new school vision.

Section 4: Reflections and Conclusions

Project Strengths and Limitations

The greatest strength of the project is the supportive structures of the PLC already in place. There is not a need for the school to overhaul its schedule or create common spaces and times to meet. The principals were supportive when working with me and using data to help their schools. They believed that the project provided enough merit, and they allowed me to use their limited development time to address the project. I did not run into issues with permission or push back in collecting data at either school.

The literature review provided ample information on Bandura's social learning theory and the connection between TCE and PLCs (Gilbert et al., 2018; Gray & Summers, 2015; Voelkel, 2019; Voelkel & Chrispeels, 2017a). I was looking to address a gap in practice and not a gap in research. The project afforded real-world job experience to find what variables were missing and address them at the school. In addition, the data showed that the school did not account for a difference in variance at the schools and allowed for me to present the same development concept at each school to help them both.

The limitation to the study was the sample size. The schools provided me with 50 and 53 completed surveys. I believe that a large part of this had to do with the COVID-19 pandemic and not being able to meet with all of the teachers in person. The pandemic created many issues for people, and this study was no different. COVID-19 also placed additional limitations on possible future studies and the implementation of the project. If the schools are still closed or primarily remote, benchmarking data will not be created

because the students are not taking the exams. The schools are not required to complete the state exam as of April 15, 2021, and therefore the school will have 2 years without state assessment data. The effect of over a year of remote learning is still unknown and could be a cause of low student achievement to be investigated by future research.

The other limitation is time constraints for the development days. In the case of both schools, they do not have two full-day planning options because these schools both have district conversations that need to happen and do not allow for full days of development. These are also the first 2 days of the new school year. Teachers need the opportunity to get their classrooms ready, per contract. This limits not only the time available to address the issue, but also the time during the school year for follow-through with the plan. The success will be reliant on the leadership of the building and district performing continuous team check-ins.

The last limitation is a result of the current research. A PLC is not a new concept or framework. Research specific to supportive conditions and shared vision and values has been very limited in scope. I was able to expand the search outside of PLCs and find research in the private sector that aligned with the two variables and building teamwork (Kirkpatrick, 2017; Law & Breznik, 2018; Martin et al., 2018).

Recommendations for Alternative Approaches

The focus of the project will be to improve the two variables of a PLC to improve TCE for the whole school. An alternative approach would be to assess each grade level or department team. In particular, the development of the relational conditions of trust and psychological safety within teams could be assessed. This would allow for focused

development for each team and would meet the teams' needs. This project was created to develop collective efficacy within a PLC as a whole school. If the data had been collected and analyzed by departments or grade levels, the results might have supported a different conclusion. This would have required a larger school to address the issue of sample size.

A second alternative approach would be to address efficacy through the human adaptation and change idea (Bandura, 1998). People's beliefs and actions are influenced by the choices that they make. Bandura (1998) called this self-efficacy. Individuals' self-beliefs affect their motivation and outcome expectations. Bandura (1998) also noted that a high sense of personal efficacy is an important contribution to group-directedness and success. A study to assess the self-efficacy of staff and its variance to collective efficacy at the school could also address variables within personal performance as it relates to team development. This research could be done at any school, as it does not require a PLC.

Scholarship, Project Development and Evaluation, and Leadership and Change

Walden has stressed the importance of students becoming agents of change. For this to occur, I, too, need to keep evolving as an educator and scholar. The development of the plan allowed me to combine both parts of my world by understanding what the literature conveys and how schools operate during development days. Most importantly, this process has allowed me to evolve as an instructional leader in my current role as principal and continue to grow as I become a superintendent. This process has taught me always to try to make decisions for students that are guided by research and founded in an established framework.

Scholarship

I believe this journey has provided me a wealth of new knowledge. I learned of the origin of PLCs and their connection to developing teaching collective efficacy. More specifically, I learned how to use data to create professional development using PLCs to affect TCE. This is a skillset that can be taken to any school or district that uses a PLC to improve student achievement. Using data to create development plans specific to staff needs is a tremendous asset for a district leader.

The collection and analysis of data represented a concern for me when I started the process—one that I was very proud to have addressed with the help of Dr. Liu. This process showed that I am capable of learning and completing large undertakings. This process provided me with confidence in moving forward to take on any challenge within my job or any educational opportunities presented to me.

The ability to interpret data is not the only hurdle that I overcame during this process. Data may tell one thing, but implementing a plan is another. Teachers' willingness to engage in professional development is often contingent on it being meaningful and relevant to their teaching practice, students' achievement, and the content area (Masuda et al., 2013). The work for this project was to create a process that would extend beyond the 3-year process of earning the EdD. For a school leader, the creation of professional development is a significant component of student achievement. The process has taught me how to gather information and provide research-based development for staff.

Project Development and Evaluation

My study started originally with a desire to see a school become better. Over the year of conversations with my chairs and reviewing materials on PLCs, I understood that there was more to address within one school that was not seeing growth. My chair pointed me to the concept of TCE, and I immediately saw many parallels to PLCs. As I began to look at the research on TCE, it showed that researchers have addressed the connection between successful PLCs implementation and TCE development, along with its support to affecting student achievement. The idea of addressing efficacy through a PLC at two area schools evolved from this concept.

I reached out to two areas schools that had both used the PLC framework in hopes of addressing student achievement. They had two different results from adoption to the current day. If the PLC had been implemented, then an additional component was not being developed. That mediating factor was TCE. The project was developed to address what aspects of a PLC at the schools affected the development of TCE the most. The study used two surveys for PLCs and TCE.

The evaluation of the project is essential to assess its effectiveness for the school. The initial data collected for analysis created a baseline for the two variables within PLCs. The project involves the creation of a team format that allows for informal evaluations throughout team meetings and a formal evaluation using the same survey questions. This will be used to assess growth of the staff at the midpoint of the school year and the end of the school year.

Leadership and Change

This process and project have shown me the importance of being an agent of change. For a school leader, it is important to know what best practices help a school and its students. Schools and community members rely on educators who hold a Doctor of Education degree for the development of change processes. Educators with this credential have become experts in their field whom people turn to for guidance. A common theme throughout the research was the importance of leadership in creating a culture for change. I expected shared leadership to be a variable for variance on TCE, but it was not one of the leading variants on the development of TCE. Schools try to stay current on policies and philosophies. Often, it is dependent on the leader to transition the school and community by creating an environment that welcomes changes and allows people to take risks. If I expect my staff and students to be lifelong learners, I have to set the example.

As I completed the literature reviews, the connection between topics continued to grow. John Dewey's progressive education theory and Vygotsky's social constructivism for PLCs connect to Bandura's social learning theory for efficacy. The development of teams and trust connected to Edmondson's psychological safety concept. The concepts continued to build on each other, showing that before one knows where one needs to go, one had better understand where one came from. As a change leader, I need to know what researchers have discovered previously to help change what is in front of me.

Reflection on Importance of the Work

As I reflect on this process, I am overcome with joy, relief, and some sadness from the completion of the journey. The level of commitment to a program and project

that is over 2 years in the making makes me realize that anything is truly possible if one puts one's mind to it. I managed to help two schools find answers on how to improve their student achievement. This process and program have given me a significant amount of personal pride in the completion of the journey. It has shown the value and importance of what researchers do and Walden's support of its students.

There are multiple levels to the importance of completing the work. On a personal level, I have grown as a leader who knows how to use current research to guide development. When people see that someone holds a doctorate, they believe that person to be an expert in their field. This project has made me believe that I can be an expert in my field in anything that I want to pursue. I have learned significant information about efficacy, both self and collective, that will allow me to grow professionally and personally.

On a professional level, this project is another piece to help schools whose leaders are looking at PLCs. It shows researchers and schools how to create development specific to a school's needs. This project can be replicated at any school looking to address TCE and find what variables have the largest variance specific to their school(s). If a researcher has a larger school, they will be able to use a single school's data to determine the variables. In smaller schools like those in this study, researchers will need to find additional locations to help address sample size.

The most important thing in this entire process, both professionally and personally, has been the merit of the work overall. The project has allowed me to see my work actually have an effect on students and teachers. Back in 2017 when I was deciding

whether to work on a dissertation addressing a gap in the literature or a project study addressing a gap in practice, I said that I wanted to find a way to help those on the front lines who help kids. That, arguably, was the best academic decision that I made on this journey.

Implications, Applications, and Directions for Future Research

The implications of this project span more than just this school. It provides a template for any researcher who would like to find site-specific connections between PLC implementation and TCE development. This study indicated that at these two specific schools, supportive conditions, along with shared vision and values, were the two variables that had the largest variance on TCE development. If this study were replicated at a different school, the variables might be completely different. The variance of the data is determined by results specific to the location.

The project or any development presented through this type of data collection and site-specific development has direct implications for the teachers and students of the school. The data support a research-based development plan to address the specific needs of the school. As efforts continue to address the importance of social change, anything directly related to the needs of the school, students, and teachers will have the largest impact in changing the school culture.

The future is still evolving for PLCs and their implications for school change. My research was specific to the development of TCE. Future research could address other aspects of teaching and/or leadership. As I noted previously, the volume of current academic knowledge of each of the five variables and their relationship to team

development, collaboration, and efficacy is not extensive. The general idea of a PLC has been addressed by research (De Neve et al., 2015; DuFour, 2004; DuFour & DuFour, 2013; DuFour & Eaker, 2009b; Hord, 2004), but future research could break PLCs into different elements to be studied further.

Conclusion

The goal of this project was to provide aid to a school that needed to close an achievement gap with the state and a neighboring school. The goal of my journey was to make myself an agent of change and learn more about myself as a professional. Both of these were achieved over the last 3 years with this project. The literature review showed me the volume of content that is available if I am willing to seek out information. The literature review also showed me that there is still a lot out there that can be discovered. Change will never stop.

PLCs are still foremost on my list of frameworks that I would like to bring into my own school district. As shown here, they increase student achievement if implemented correctly. That, I believe, is the biggest hurdle in any school. There must be a reason to change and buy-in for the change. Schools cannot just create a new schedule, meet as teams, and assume that student achievement will increase. There has to be a cultural change that aligns with the vision and goals of the community. There has to be effective leadership that promotes risk-taking and allows teachers to share their successes and failures without fear of repercussions.

Lastly, I learned during the process that the use of data on a larger scale to assess effectiveness and correlation is important. It is easy to see when things are not working,

but it can be difficult to find out why and make the change. This project and program showed me how to collect data effectively and use data to interpret results. The educators at the school in this project thought that they were doing things right, but the data showed that if they improved two variables, they could address the issue of student achievement. Teachers want development specific to their needs. The collection of site-specific data helps show the validity and rationale of a school's development.

Looking back at this project and the process, I can think of a few things that I might have changed or reconsidered. I could have added more schools with similar testing results to assess correlation. I could have chosen to look at a single high school that was much larger. In the grand scheme, I am very happy with the product and the goal achieved. I believe that this is how a marathon runner feels after their first run. Perhaps along my run I could have sped up or slowed down, but in the end, I crossed the finish line and can start preparing for the next event.

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Appendix A: The Project

Professional Development: 3-Day Training Session

"Using PLCs to create Teacher Efficacy"

Purpose

- Address the PLC variables Shared Vision and Values and Supportive Conditions to affect development of TCE.

Program Goals

- Assess current vision statement of school and address if necessary
- Create goals within each PLC team
- Create informal benchmarks to assess goals
- Set up team meeting structure to allow for collaboration and risk-taking
- Create opportunities to celebrate

Program Outcomes

- Leaders will use the development days to address the school vision, values, and supportive conditions.
- Leaders will create a shared school vision
- Team leaders will use shared vision and values to create SMART GOALS aligned to student achievement
- Team leaders will make meetings relevant, relatable, and engaging.
- Leaders will create environments where risk taking is welcome and best practices are shared

Target Audience

- School Administration
- PLC team leaders
- Community stakeholders for vision statement

Format

- PowerPoint Presentation
- Hands-on activities
- Critical Thinking
- Role Playing
- Group conversations and presentations

Timeline

- The implementation will take place at the start of the 2021-2022 school year. Day one and day two are the first two days of the new school year and designated as staff institute days. The third day will be at the end of the semester in December. The administrators at the building will create a team of community stakeholders, including parents, business owners, team leaders, and/or teachers to be available on the first day to assess the vision statement. This meeting will be held in the school's conference room, or if COVID restrictions are still in place, via a streaming program. Teacher's rooms will be used to address team specific goals.

Materials/Equipment

- Computer
- Projection device in conference room and classroom
- Handouts
- Sign-in sheets
- Sample agenda
- Sample vision statements
- Paper and pencil
- Large sheets of paper to share thoughts with room.
- Evaluation Form for ISBE CPDUs

Professional Development: 3-Day Training Session

Day 1 Training-Shared Vision and Values

8:30-9:00	Breakfast
9:00-10:00	District Wide Introduction and Opening
10:00-11:00	Welcome and Introductions
	Purpose and Goal for the Training
	Student Data
	Overview of the Study
	Informal Self-Rating for Staff
11:00-12:00	Lunch
12:00-2:30	Vision/Values Stakeholders meet
	Does the current one work?
	What are the important values of community?
2:30-3:00	Evaluation and CPDUs

Day 2 Training-Supportive Conditions

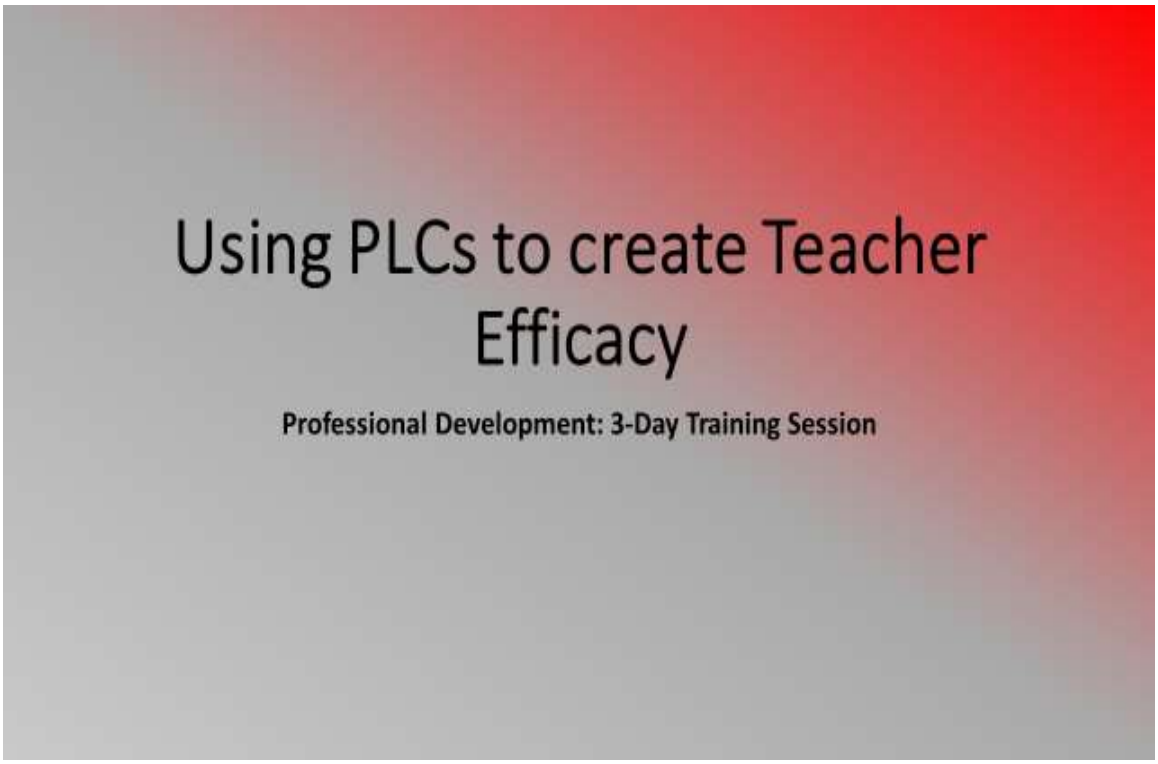
8:30-9:00	Breakfast
9:00-10:00	Share Mission Statement with staff
	Group presents how it was created
	Group presents how it expresses community values
	Role Play “We will as PLC…” goals
	Present Plan and Goal for Team Meetings

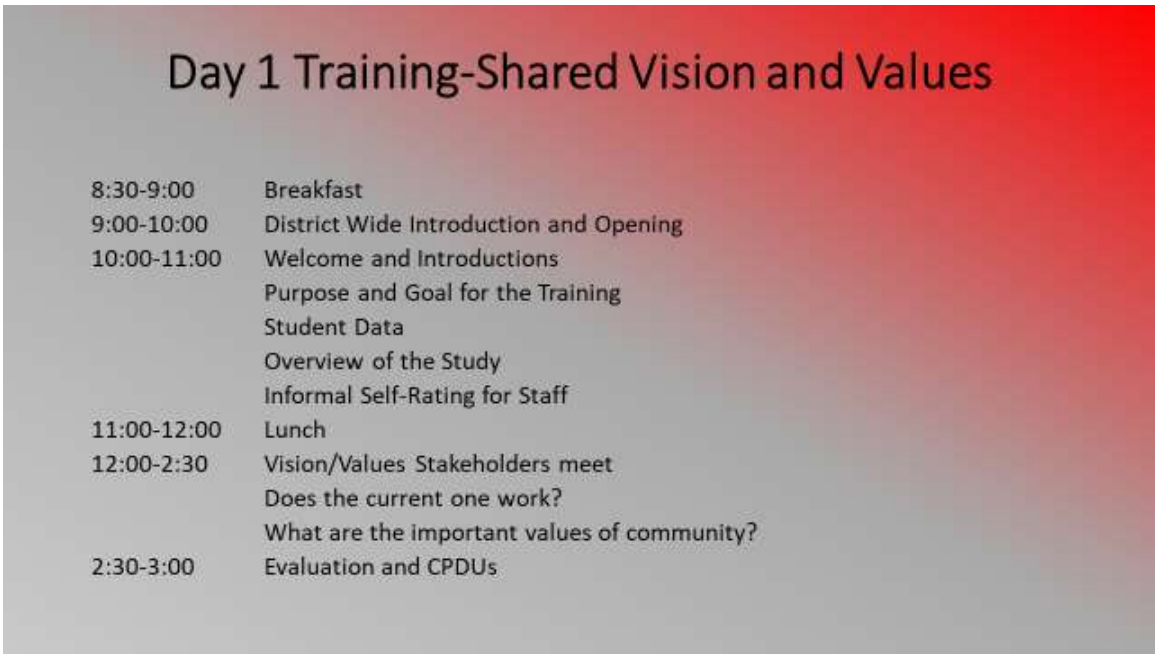
10:00-10:15	Break-Head to Breakout Rooms
10:15-11:45	Grade Level PLC Team Meeting
	How does the Mission relate to our grade?
	What are the three Goals we want to make?
	How will we know if we achieve it?
	What is the role of each member?
11:45-12:45	Lunch
12:45-2:15	Department PLC Team Meeting
	How does the Mission relate to our department?
	What are the three Goals we want to make?
	How will we know if we achieve it?
	What is the role of each member?
215-3:00	Evaluation, CPDUs, and Teacher Prep for first day of school

Day 3 Training-Celebration and Evaluation (Student ½ Day)

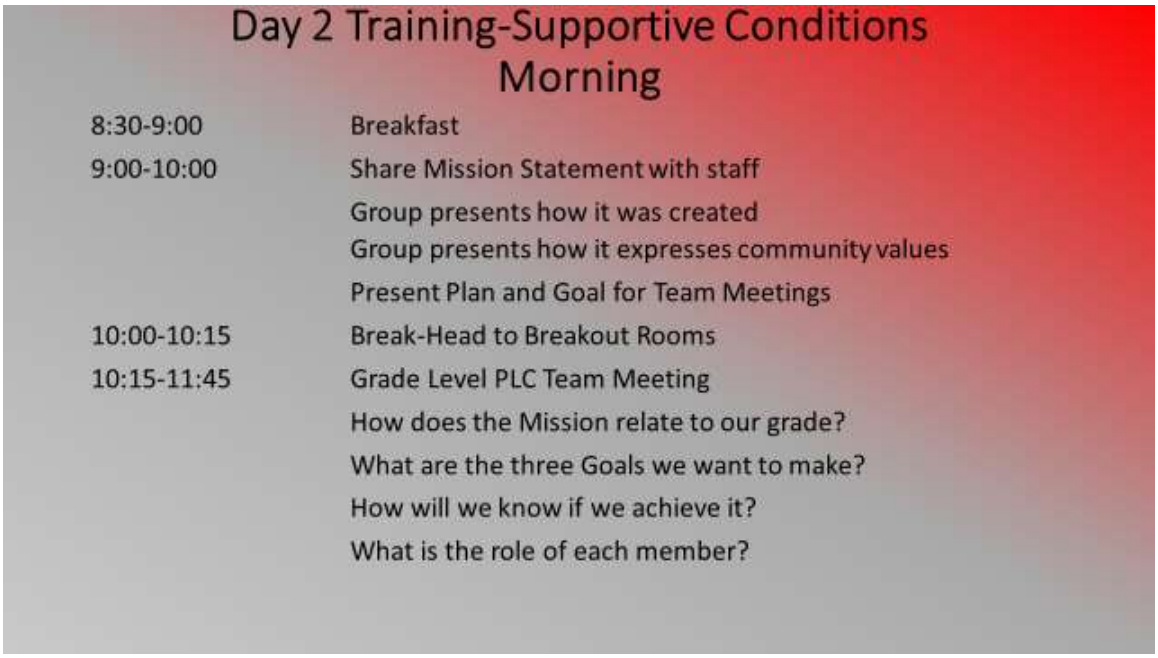
11:45-12:30	Lunch-Provided by School
	Staff Discussions
12:30-3:00	Presentation of Student Data
	Celebrate Staff and Team Successes
	Complete PLCA-R Survey Questions
	Complete TCE Survey Questions

Slides Presented during Project Professional Development

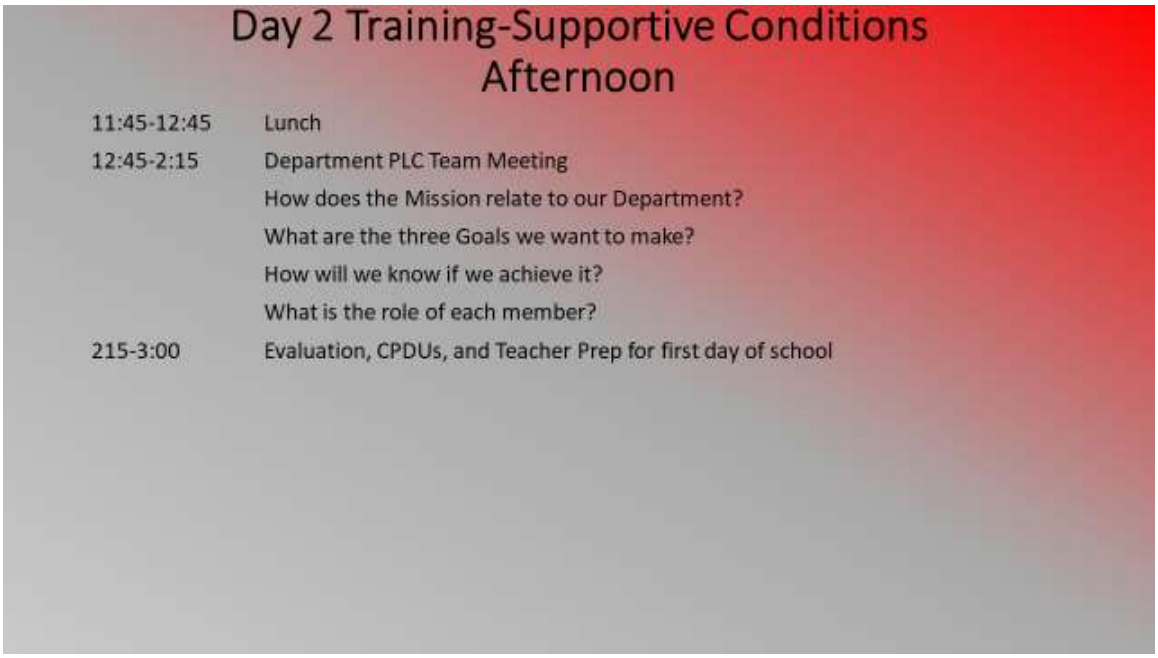




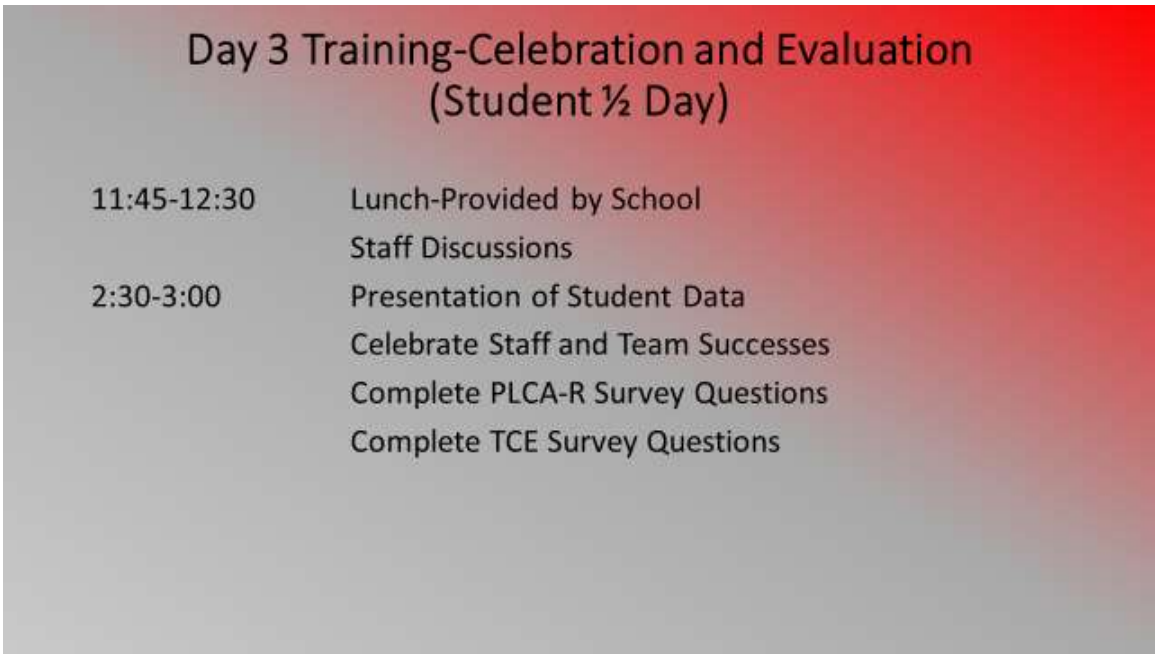
The slide is presented and given as a hand-out to show the timeline and activities for the day. This slide will be read.



The slide is presented and given as a hand-out to show the timeline and activities for the second day in the morning. This slide will be read.



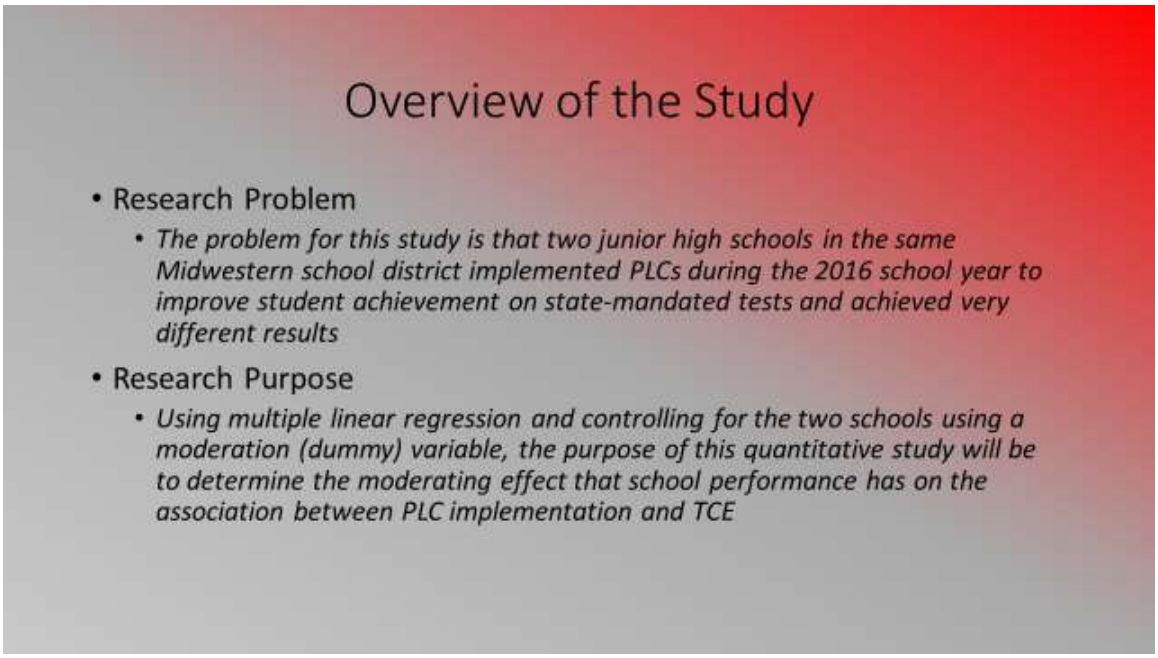
The slide is presented and given as a hand-out to show the timeline and activities for the second day in the afternoon. This slide will be read.



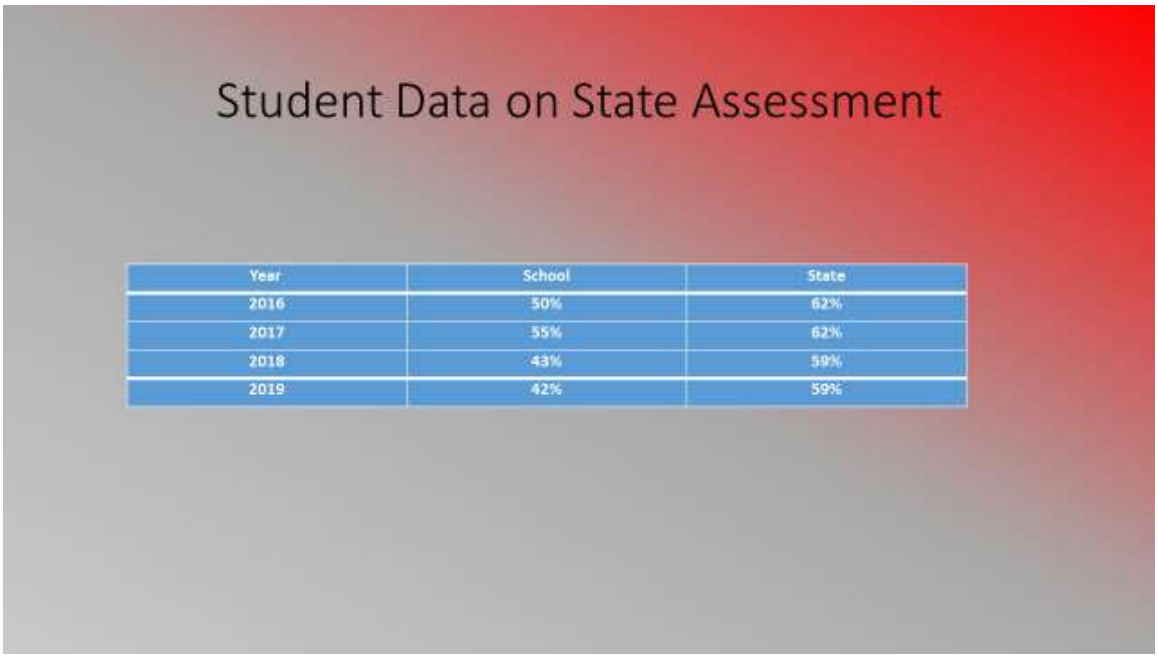
The slide is presented and given as a hand-out to show the timeline and activities for the third day. This slide will be read.


Day One-Mission Statement

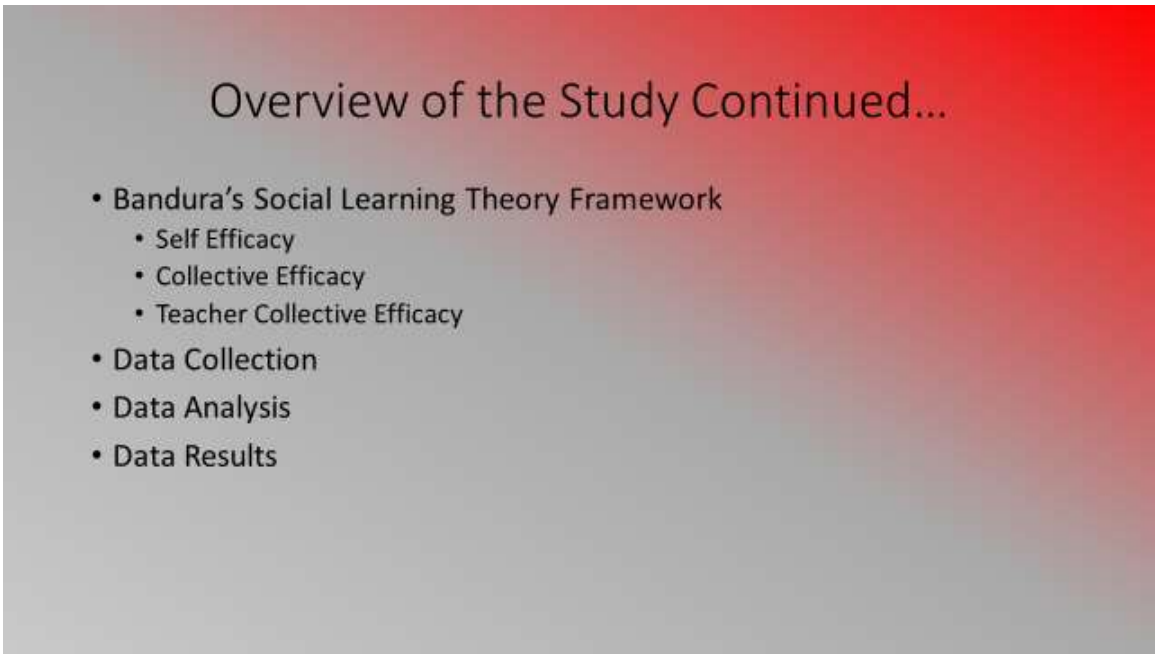
The purpose of this slide is to tell the school who I am, why I am there, and give them background to what value the project will provide them.



This slide explains how the process started and developed throughout the project. Though a second school is mentioned, the name and location of the school will not be disclosed to the staff.



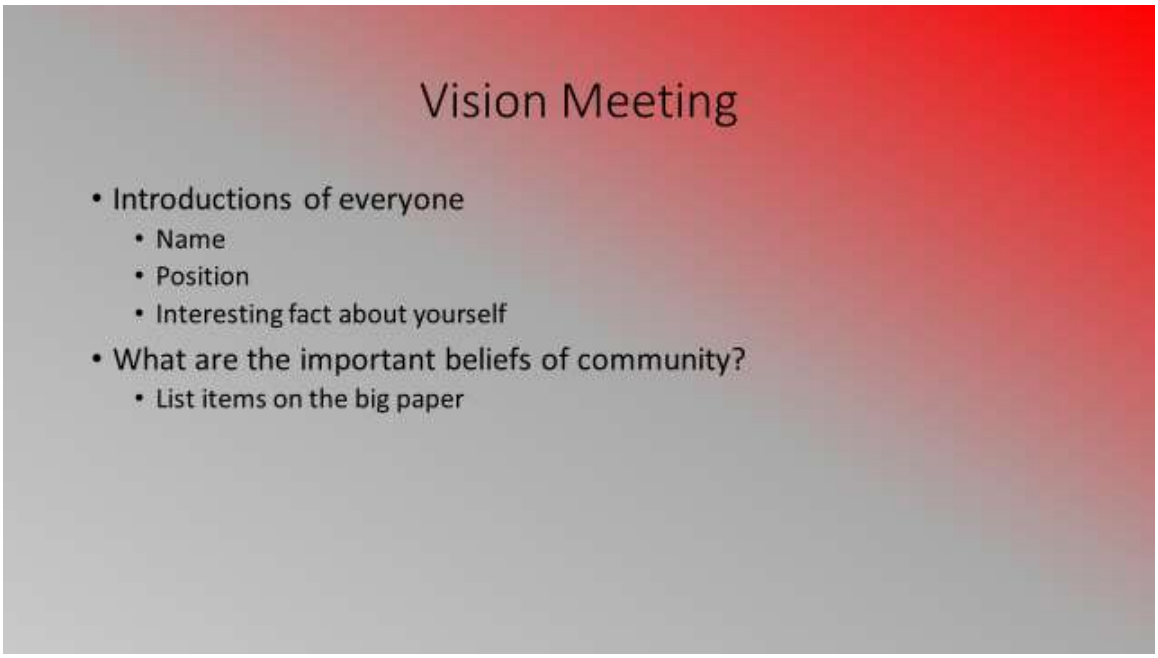
This slide shows the data from the State Assessment that arrived me at addressing their school's student achievement gap.



This slide provides talking points about the study. I will explain the use of Bandura's work for the framework. I will explain how the data collected from them in January was used to develop a connection between PLC variables and TCE.

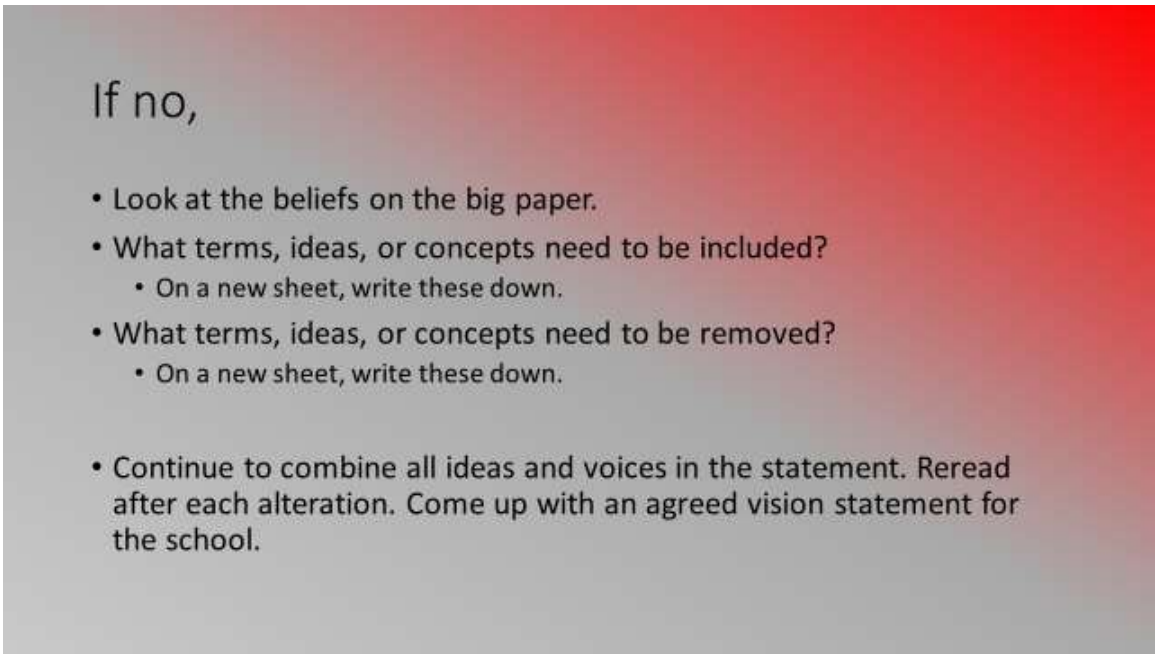
This slide shows their baseline data on a scale of 1-4 for the variables with the highest variance on efficacy.

This slide is to provide them an overall direction for the development days. This slide will be read.



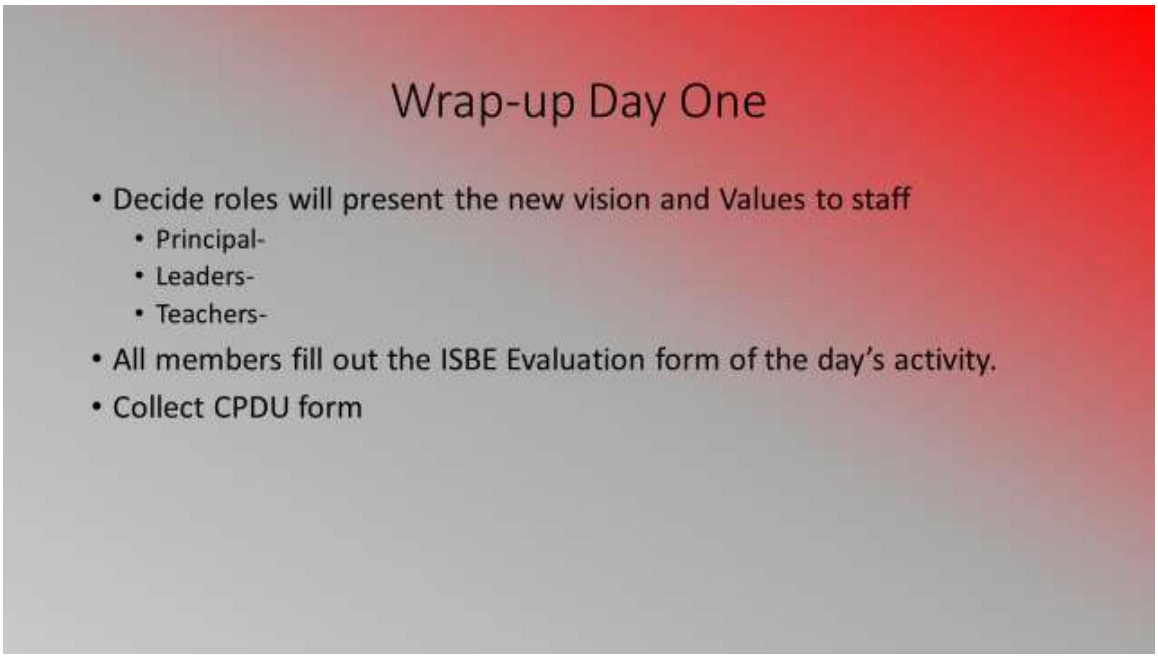
This will take place in the conference room with the stakeholders. This is meant for them to get to know each other and their roles within the community. The second question is meant to get ideas flowing before they even look at the mission statement. As they come up with ideas and beliefs, they are put on the board for reference later.

Here is the current Vision Statement. The team will read it and refer to the beliefs they just established. We will take this statement line by line and check off the beliefs on the paper to see what is covered by this vision statement.



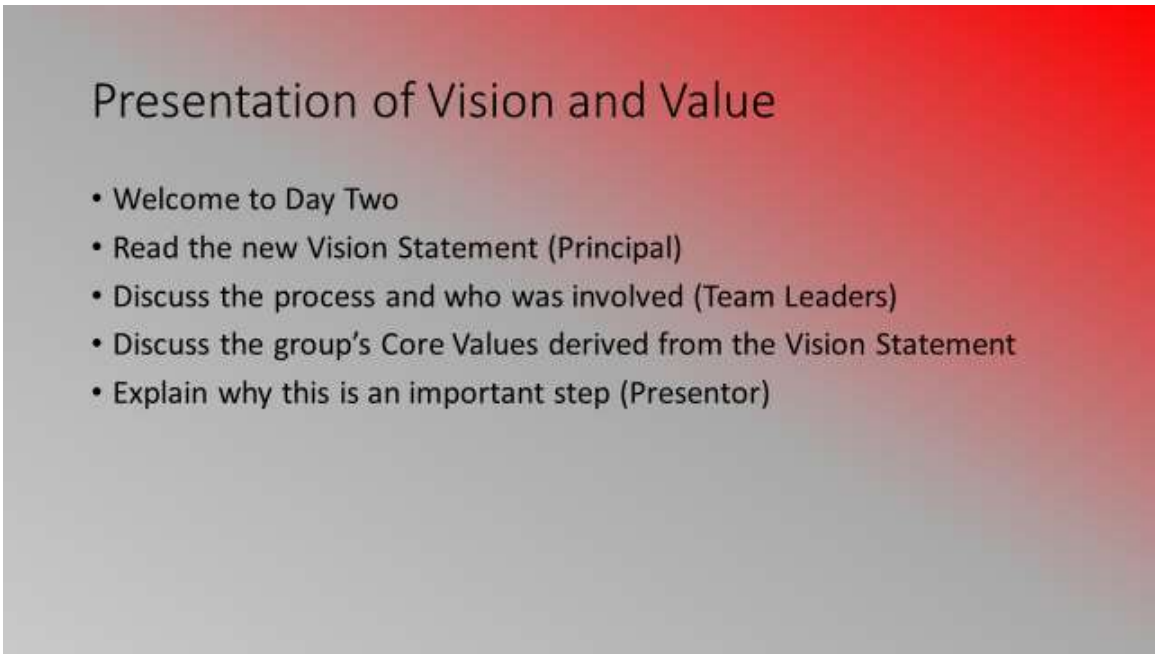
This is the most important process of the day. This slide only needs to be used if the stakeholders agree the vision does not match the beliefs of the community. This may be a small edit to the current statement, or it could take significant time. The whole group needs to have their voice heard and the whole group needs to agree to the vision. This will allow leadership to go back to the staff and community to convey the teamwork and buy-in for the new vision.

This slide either is right after vision statement if they believe the vision statement conveys the beliefs of the school and community or it is presented after the “no” slide once the team develops a new vision statement. The values will suggested by the stakeholders from the vision statement and will be written on the sheet of paper. Once everyone has had a chance to comment on the values, we will take the sheet and narrow the list and combine concepts. These need to be specific and direct. These values will be what the teams will use the next day to create their SMART GOALS and address the supportive conditions.



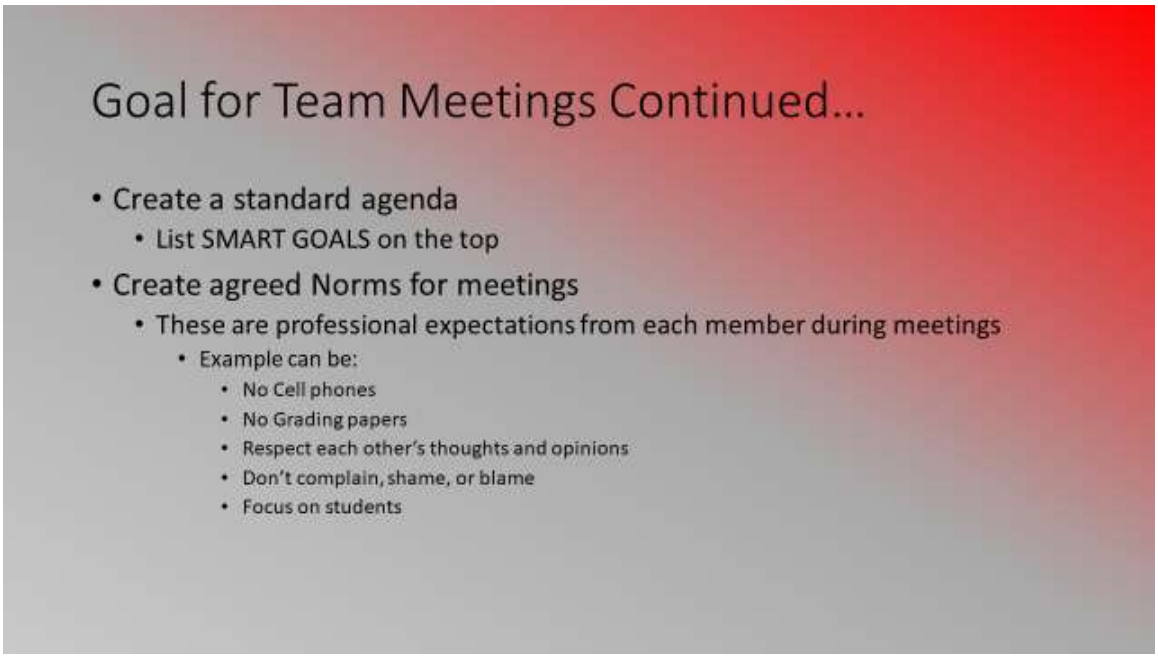
An important part of conveying a vision statement is to show the staff the buy-in from the stakeholders. Staff needs to know the vision was not created by one person, but a group of people with student achievement as their goal. By deciding roles day one, it allows them to take the evening to prepare what they want to say during their portion of the day two presentation.

The slide displayed as the staff finish up breakfast and join the meeting.



The stakeholder team will report the mission statement (old or new) and it will be on the slide. It is not able to be here because we do not know what the statement will be. The discussion is then led by the three groups listed (principal, leaders, and teachers). After that, I will discuss how the values created by the group should be used for the day's activity of creating goals within their grade and department level teams.

This slide will be read to the group and then role-playing will take place with me, the principal, and a few members of the leadership team. We will walk through the process by assigning each of us roles and developing SMART GOALS for our team. The goal of the role-playing is the mimic conversations aligned to student growth based on the values expressed from the stakeholders.

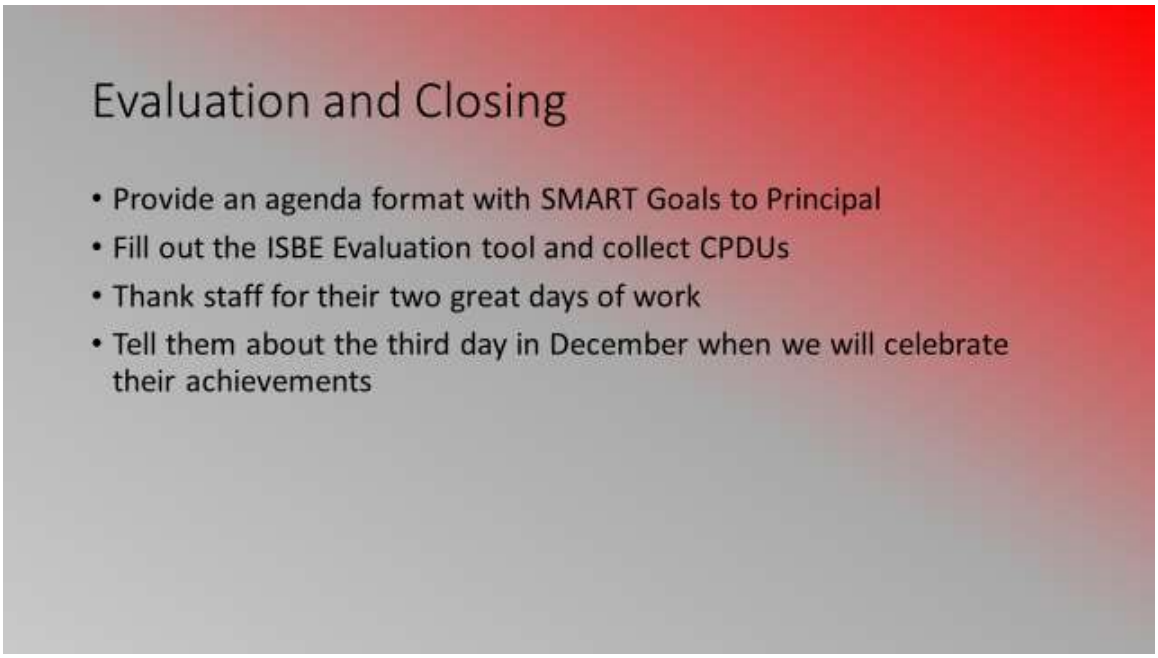


We will continue with our role-playing in this slide. The topic of professionalism is within this slide. I will reiterate that norms are not questioning professionalism of anyone, but provide concrete expectations of all members to keep the meetings' focus on the students.

Role-playing has already covered these next two slides. They will be read to express the importance of all teams no matter the content or grade.

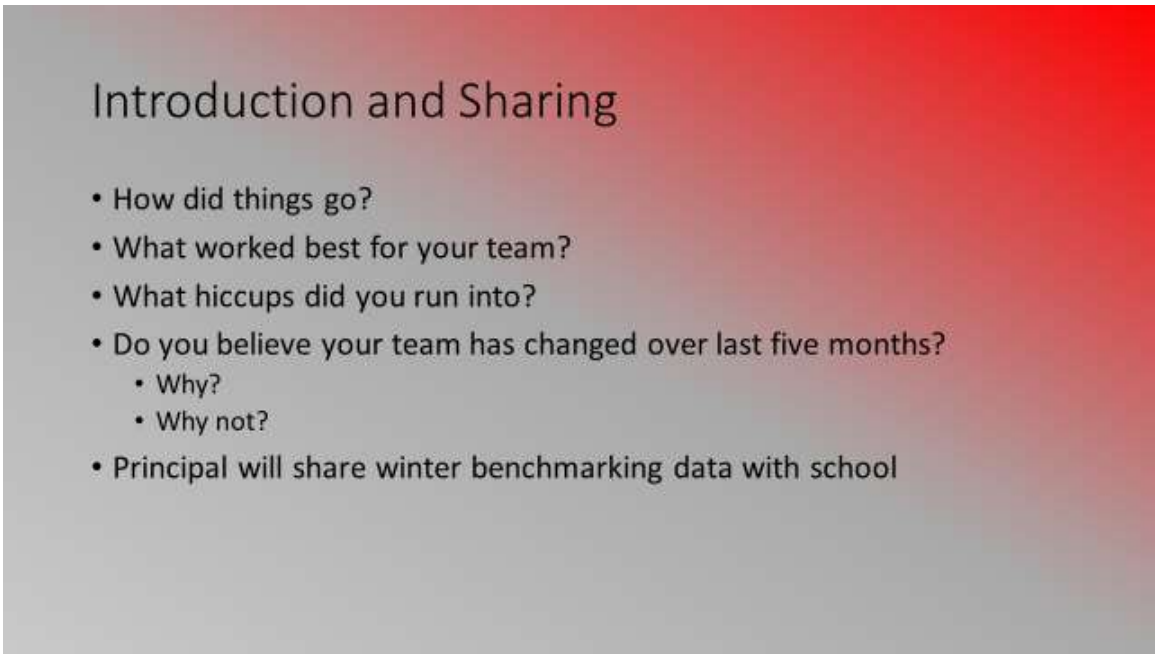
This will be read to express the importance of all teams no matter the content or grade. I will then instruct the teams to head to their grade level teams for the rest of the morning. I will walk around with the principal to each group to help them during this process. I will be available to answer questions for each team.

After lunch, the departments will be meeting. This is all listed on their agenda handout. I will also be walking around with the principal to these meetings in the afternoon to help guide them and answer any questions.



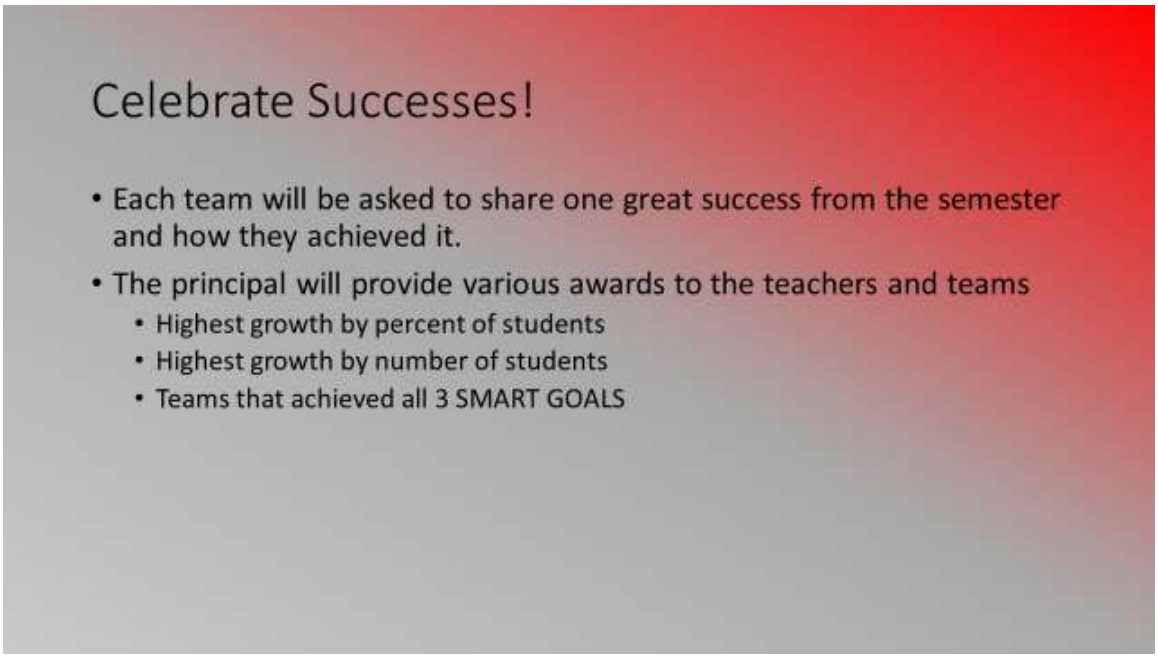
At the end of the day, we will have the teachers meet back with us to go over the past two days. We will have them give the principal their agenda template to keep on file, including their SMART GOALS. We will have a few teachers share their experience from the day and their expectations for the coming semester. We will provide them with the evaluation form and CPDUs for the day.


Day Three-Celebration and Evaluation

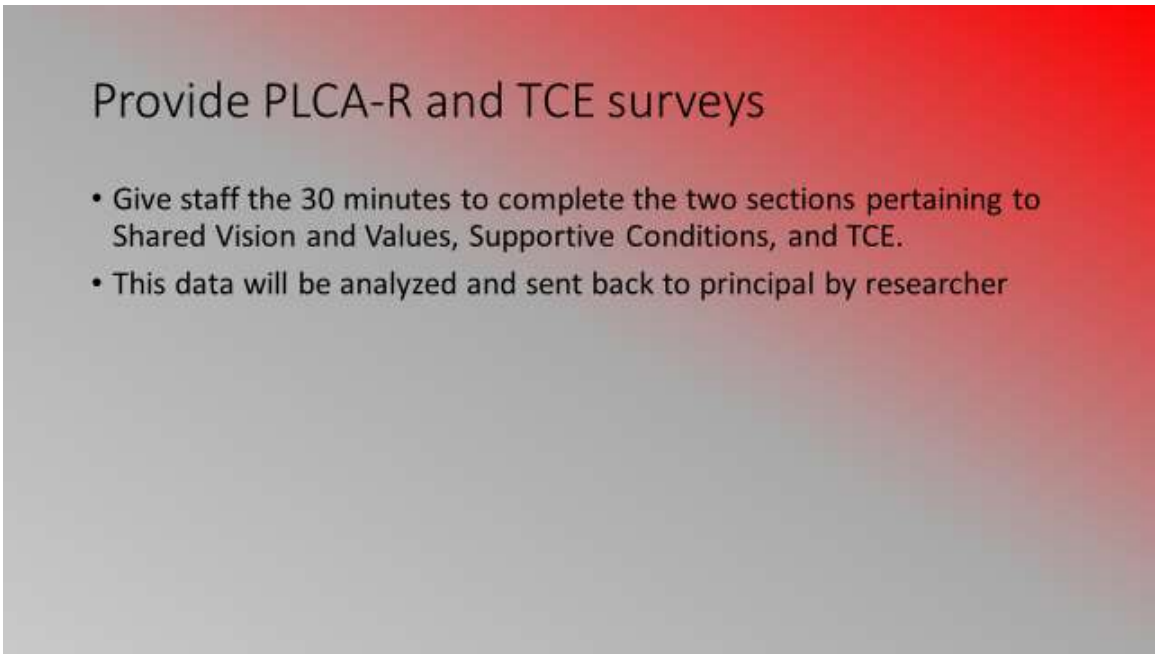


This is the day I am looking forward to the most with this project. This is where I find out if the work over my last two years and the semester for the teachers had made a difference for their students. I will walk through the slide asking the teachers to share their experiences with the new mission, goals, and norms. I believe reflection is critical in the growth of any group or individual. Here is where we find out how the process went and what could have been different.

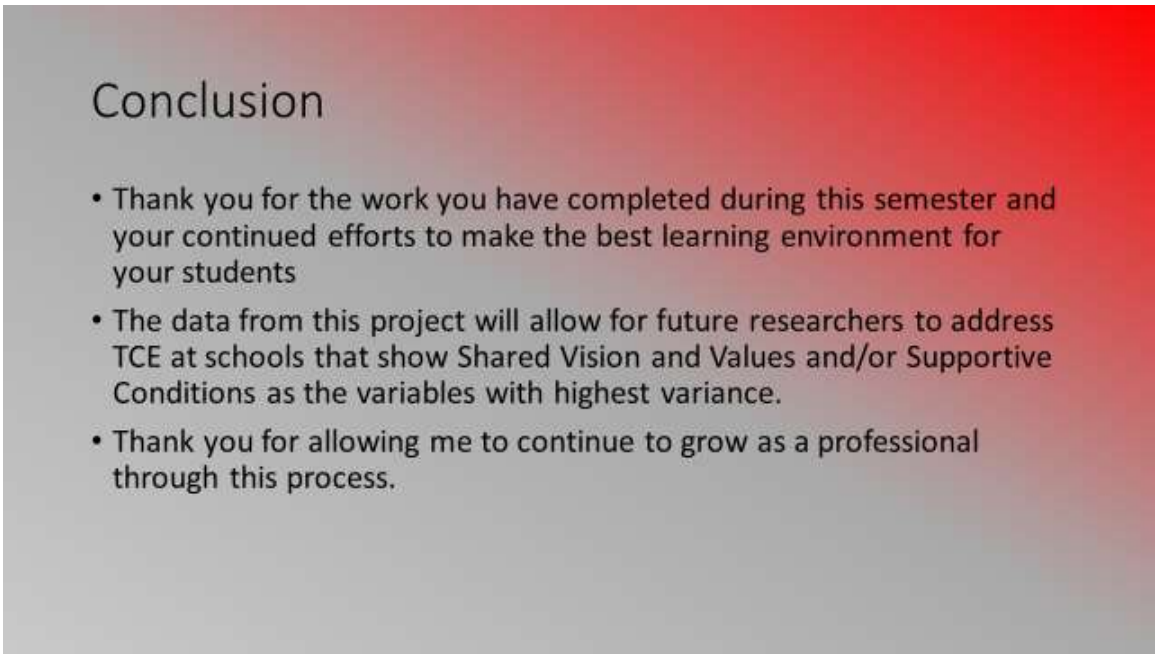
The principal will share the NWEA MAP data from fall to winter. She will use this data to discuss areas of growth for students and where the school is still looking to address areas of concern. It will be important to remind the staff that Rome was not built in a day and to not feel defeated after only a few months of work. PLCs take time and energy to bring about change.



I will have the principal lead the discussion on the successes of each team. The goal is to transition the development and conversations from me to them. I have also left it up to the principal to decide how the staff would be awarded/honored for their work. The school allocates money for staff development that will be saved by me doing this development. That money can be used to fund the celebration event as they sees fit.



After the celebration, the teachers will be provided the questions about supportive conditions, shared vision and values, and TCE. These questions will be completed through the same Google Form. This data will be analyzed by me and given back to the principal to see if the data shows improvement in the average scores of SVV, SC, and TCE.



This slide just conveys the importance of their involvement in the process, the importance of the work as a whole to PLCs and TCE, and my genuine appreciate for their time and energy to allow me into their schools and classrooms in order to meet my personal goal of completing my Ed.D.

Appendix B: Instruments and Permissions

PLCA-R Permission

PLC ASSOCIATES

May 24, 2020

Jack Gaham
Doctoral Candidate
Walden University
Griffith, Indiana 46319

Dear Mr. Gaham:

This correspondence is to grant permission for the utilization of the *Professional Learning Community Assessment-Revised* (PLCA-R) for your doctoral research at Walden University. I am pleased you are interested in using the PLCA-R measure to *examine the relationship between collective efficacy and professional learning communities within the schools.* This study's findings will contribute to the PLC and efficacy literature.

This permission letter allows use of the paper-pencil version of the PLCA-R. While this letter provides permission to use the measure in your study, authorship of the measure will remain as Olivier, Hipp, and Huffman, 2010 (exact citation on the following page). This permission does not allow renaming the measure or claiming authorship.

Upon completion of your study, I would be interested in learning about your findings and would welcome the opportunity to receive an electronic version of your study outcomes. Thank you for your interest in our research and measure for assessing professional learning community attributes within schools. Should you require any additional information, please feel free to contact me.

Sincerely,

Dianne F. Olivier

Dianne F. Olivier, Ph. D.
Professor and Coordinator of the Doctoral Program
Joan D. and Alexander S. Haig/BORSF Professor
Department of Educational Foundations and Leadership
College of Education, University of Louisiana at Lafayette
P.O. Box 43091, Lafayette, LA 70504-3091
(337) 482-6408 (Office)
dianne.olivier@louisiana.edu
http://www.plcassociates.org

cc: Dr. Jane Huffman
Dr. D'Ette Cowan

CTES Permission Letter

Re: CTES permission

Roger Goddard <dr.roger.goddard@gmail.com>
Thu 3/5/2020 11:18 PM
To: Jack Gaham <jack.gaham@waldenu.edu>

Dear Jack:

If you are referring to the American educational research journal publication with the 21 item scale from 2000, I'm happy to grant you permission if you promise to use it only for research purposes and not for profit or any form of revenue generation. You may wish to check with the journal as I'm pretty sure they require a full citation to the original work.

Good luck with your study.
Thanks,

Roger

> On Mar 5, 2020, at 4:01 PM, Jack Gaham <jack.gaham@waldenu.edu> wrote:
>
> Dr. Goddard:
>
> My name is Jack Gaham and I am a doctoral student at Walden University under the supervision of Dr. James Bailey. My dissertation is assessing the correlation of collective efficacy and PLC implementation sub-groups. I have read a lot of your work on collective efficacy and its relation to various instructional structures. I want to thank you for your contribution to the academic world and the insights you have provided me.
>
> My email is to ask your permission to use the CTES that was developed by Hoy, Hoy and yourself in 2000 to collect efficacy data on my school locations to assess collective efficacy. Dr. Bailey also suggests that I ask if you would recommend sources of validation to add within my methodology section. I have found research into the CTES that validated their finding by Dr. McCoach and Dr. Colbert from 2010.
>
> I appreciate anything you are able to offer an aspiring doctoral student and thank you for your time.
>
> Jack Gaham
> Walden University

PLCA-R Survey

Professional Learning Communities Assessment – Revised

Directions:
This questionnaire assesses your perceptions about your principal, staff, and stakeholders based on the dimensions of a professional learning community (PLC) and related attributes. This questionnaire contains a number of statements about practices which occur in some schools. Read each statement and then use the scale below to select the scale point that best reflects your personal degree of agreement with the statement. Shade the appropriate oval provided to the right of each statement. Be certain to select only one response for each statement. Comments after each dimension section are optional.

Key Terms:
- Principal = Principal, not Associate or Assistant Principal
- Staff/Staff Members = All adult staff directly associated with curriculum, instruction, and assessment of students
- Stakeholders = Parents and community members

Scale:
1 = Strongly Disagree (SD)
2 = Disagree (D)
3 = Agree (A)
4 = Strongly Agree (SA)

STATEMENTS		SCALE			
	Shared and Supportive Leadership	**SD**	**D**	**A**	**SA**
1.	Staff members are consistently involved in discussing and making decisions about most school issues.				
2.	The principal incorporates advice from staff members to make decisions.				
3.	Staff members have accessibility to key information.				
4.	The principal is proactive and addresses areas where support is needed.				
5.	Opportunities are provided for staff members to initiate change.				
6.	The principal shares responsibility and rewards for innovative actions.				

7.	The principal participates democratically with staff sharing power and authority.				
8.	Leadership is promoted and nurtured among staff members.				
9.	Decision-making takes place through committees and communication across grade and subject areas.				
10.	Stakeholders assume shared responsibility and accountability for student learning without evidence of imposed power and authority.				
11.	Staff members use multiple sources of data to make decisions about teaching and learning.				
	Shared Values and Vision	**SD**	**D**	**A**	**SA**
12.	A collaborative process exists for developing a shared sense of values among staff.				
13.	Shared values support norms of behavior that guide decisions about teaching and learning.				
14.	Staff members share visions for school improvement that have an undeviating focus on student learning.				
15.	Decisions are made in alignment with the school's values and vision.				
16.	A collaborative process exists for developing a shared vision among staff.				
17.	School goals focus on student learning beyond test scores and grades.				
18.	Policies and programs are aligned to the school's vision.				
19.	Stakeholders are actively involved in creating high expectations that serve to increase student achievement.				
20.	Data are used to prioritize actions to reach a shared vision.				
	Collective Learning and Application	**SD**	**D**	**A**	**SA**
21.	Staff members work together to seek knowledge, skills and strategies and apply this new learning to their work.				
22.	Collegial relationships exist among staff members that reflect commitment to school improvement efforts.				

23.	Staff members plan and work together to search for solutions to address diverse student needs.				
24.	A variety of opportunities and structures exist for collective learning through open dialogue.				
25.	Staff members engage in dialogue that reflects a respect for diverse ideas that lead to continued inquiry.				
26.	Professional development focuses on teaching and learning.				
27.	School staff members and stakeholders learn together and apply new knowledge to solve problems.				
28.	School staff members are committed to programs that enhance learning.				
29.	Staff members collaboratively analyze multiple sources of data to assess the effectiveness of instructional practices.				
30.	Staff members collaboratively analyze student work to improve teaching and learning.				
	Shared Personal Practice	**SD**	**D**	**A**	**SA**
31.	Opportunities exist for staff members to observe peers and offer encouragement.				
32.	Staff members provide feedback to peers related to instructional practices.				
33.	Staff members informally share ideas and suggestions for improving student learning.				
34.	Staff members collaboratively review student work to share and improve instructional practices.				
35.	Opportunities exist for coaching and mentoring.				
36.	Individuals and teams have the opportunity to apply learning and share the results of their practices.				
37.	Staff members regularly share student work to guide overall school improvement.				
	Supportive Conditions - Relationships	**SD**	**D**	**A**	**SA**

38.	Caring relationships exist among staff and students that are built on trust and respect.				
39.	A culture of trust and respect exists for taking risks.				
40.	Outstanding achievement is recognized and celebrated regularly in our school.				
41.	School staff and stakeholders exhibit a sustained and unified effort to embed change into the culture of the school.				
42.	Relationships among staff members support honest and respectful examination of data to enhance teaching and learning.				
43.	Time is provided to facilitate collaborative work.				
44.	The school schedule promotes collective learning and shared practice.				
45.	Fiscal resources are available for professional development.				
46.	Appropriate technology and instructional materials are available to staff.				
47.	Resource people provide expertise and support for continuous learning.				
48.	The school facility is clean, attractive and inviting.				
49.	The proximity of grade level and department personnel allows for ease in collaborating with colleagues.				
50.	Communication systems promote a flow of information among staff members.				
51.	Communication systems promote a flow of information across the entire school community including: central office personnel, parents, and community members.				
52.	Data are organized and made available to provide easy access to staff members.				

CTES Survey

	Statement	SD	D	A	SA
1	Teachers in this school have what it takes to get the children to learn.				
2	Teachers in this school are able to get through to difficult students.				
3	If a child does not learn something the first time, teachers will try another way.				
4	Teachers here are confident they will be able to motivate their students.				
5	Teachers in this school really believe every child can learn.				
6	If a child does not want to learn, teachers here give up.				
7	Teachers here need more training to know how to deal with these students.				
8	Teachers in this school think there are some students that no one can reach.				
9	Teachers here do not have the skills needed to produce meaningful student learning.				
10	Teachers here fail to reach some students because of poor teaching methods.				
11	These students come to school ready to learn.				
12	Home life provides so many advantages they are bound to learn.				
13	The lack of instructional materials and supplies makes teaching very difficult.				
14	Students here just are not motivated to learn.				
15	The quality of school facilities here really facilitates the teaching and learning process.				
16	The opportunities in this community help ensure that these students will learn.				
17	Teachers here are well prepared to teacher the subject they are assigned to teach.				
18	Teachers in this school are skilled in various methods of teaching.				
19	Learning is more difficult at this school because students are worried about their safety.				

20	Drug and alcohol abuse in the community make learning difficult for students here.				
21	Teachers in this school do not have the skills to deal with student disciplinary problems.				

Appendix C: School A Baseline Data

	Shared Vision and Values	Support Conditions	Collective Efficacy
	2.22	2.80	3.30
	3.22	3.47	2.90
	2.56	3.00	3.20
	2.56	2.60	2.78
	2.56	2.93	2.95
	2.33	2.87	1.80
	3.56	3.60	3.20
	3.78	3.73	3.35
	2.00	1.87	2.60
	2.78	2.67	3.05
	3.78	3.73	3.35
	3.78	3.73	3.35
	3.11	2.80	2.95
	2.89	3.07	2.85
	2.89	2.87	3.15
	1.11	2.40	2.00
	1.67	3.13	2.20
	1.56	2.27	2.25
	2.00	2.93	2.45
	3.00	2.87	2.20
	2.33	2.80	2.45
	2.56	2.60	2.40
	3.56	3.53	3.16
	2.89	2.40	2.95
	2.44	2.80	2.25
	3.78	3.87	3.20
	2.33	2.73	2.85
	2.44	2.47	2.50
	2.56	2.53	2.50
	2.33	2.40	2.60
	2.11	1.71	2.30
	1.89	2.40	2.80
	1.56	2.40	2.68
	3.56	3.87	3.10
	2.89	2.53	2.70
	2.44	2.40	2.45
	2.44	2.40	2.45
	2.44	2.40	2.45
	2.44	2.40	2.45
	3.22	3.20	2.60
	3.00	3.07	2.70
	2.11	1.47	2.05
	2.33	2.40	2.35
	2.33	2.40	2.35
	2.33	2.40	2.35
	2.33	2.40	2.35
	2.33	2.40	2.35
	2.78	2.40	2.70
	2.38	2.53	2.75
	2.44	2.47	2.40
Avg. Score	**2.60**	**2.74**	**2.66**

Appendix D: School B Baseline Data

	Shared Vision and Values	Support Conditions	Collective Efficacy
	3.55	3.93	3.45
	3.27	3.50	3.00
	3.45	3.87	3.30
	2.18	3.00	3.45
	3.36	3.20	2.95
	3.73	3.67	2.95
	3.91	3.73	2.90
	3.73	3.80	3.30
	2.82	2.73	2.95
	2.91	3.53	3.20
	3.82	4.00	3.50
	4.00	3.80	3.45
	2.91	3.00	3.40
	3.18	3.20	2.90
	3.27	3.60	3.40
	3.09	3.13	2.80
	3.91	4.00	3.00
	3.00	3.00	2.80
	3.91	4.00	3.50
	3.45	3.53	3.30
	3.27	3.60	3.35
	3.45	3.40	2.85
	3.91	3.53	3.70
	2.91	3.00	2.75
	2.82	3.00	2.85
	3.55	3.60	3.25
	3.36	3.43	3.45
	3.36	3.43	3.45
	3.36	3.43	3.45
	3.36	3.43	3.45
	3.36	3.43	3.45
	3.00	3.33	3.40
	3.18	3.27	3.35
	3.44	3.27	3.05
	3.64	3.73	3.05
	3.09	2.93	2.85
	3.64	3.93	3.20
	3.73	3.87	3.40
	3.73	3.87	3.40
	3.73	3.87	3.40
	3.73	3.87	3.40
	3.73	3.87	3.40
	3.27	3.87	3.30
	2.64	3.13	3.05
	3.73	3.87	3.40
	1.73	1.93	1.65
	3.82	3.47	3.32
	3.55	3.93	3.40
	3.55	3.93	3.40
	3.55	3.93	3.40
	3.55	3.93	3.40
	3.55	3.93	3.40
Avg. Score	3.38	3.53	3.21