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A Multidimensional Measure of Professional Learning Communities: The Development and Validation of the Learning Community Culture Indicator (LCCI)

Courtney D. Stewart
Brigham Young University - Provo

A MULTIDIMENSIONAL MEASURE OF PROFESSIONAL LEARNING COMMUNITIES:

The Development and Validation of the Learning Community Culture Indicator (LCCI)

Courtney Dennis Stewart

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Dr. Joseph Matthews
Dr. Ellen Williams
Dr. Sterling Hilton
Dr. LeGrand A. Richards
Dr. Pam Hallam

Department of Educational Leadership and Foundations

Brigham Young University

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ABSTRACT

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of the Learning Community

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Because of disunity among prominent professional learning community (PLC) authors, experts, and researchers, the literature was studied to develop a ten-element model that represents a unified and reconceptualized list of characteristics of a PLC. From this model, the Learning Community Culture Indicator (LCCI) was developed to measure professional learning community (PLC) implementation levels based on the ten-element model. Exploratory and confirmatory factor analyses were performed to determine the structural validity of the LCCI. Factor analyses provided successful levels of fit for the models tested in representing the constructs of the LCCI. Reliability measures also indicated high levels of internal consistency among the responses to the survey items. Although some items and elements had moderate levels of fit and need additional revisions and validity testing, the LCCI produced substantial evidence

that this survey was a valid and reliable instrument in measuring levels of PLC implementation across the ten elements.

Because this research validated the LCCI, school leaders can implement, monitor, and diagnose elements of PLCs in their schools. The LCCI also provides a method in which future research can be conducted to empirically support the influence of PLCs and student achievement. Potential uses and recommendations for further research and consideration are presented. A call for more empirical research is made in connecting the PLC reform model to improved student learning. The theory of PLC is at a point of substantiation and growth. The LCCI is recommended as potential tool for studying and facilitating the implementation of PLCs in schools.

Keywords: Professional learning communities (PLC), Learning Community Culture Indicator (LCCI), survey validation, confirmatory factor analysis, and school reform.

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CHAPTER 1

INTRODUCTION

Educators at Monarch Middle School have been on a journey for five years to shift the culture of the school to focus more on the individual learning needs of students. They have formed instructional teams and have begun to meet regularly in those teams to build common assessments and to collaborate on improving instructional practice. Teachers have become leaders who are active in deciding key instructional decisions related to the school. Half of the faculty and staff have attended national trainings on how to become a professional learning community (PLC). Most educators in the school understand that becoming a PLC is a long journey and that they may never reach the summit. Many leaders have wondered if there could be a way to determine how they are doing along this journey. Knowing where everyone is in the school regarding PLC practices could help in redirecting or enforcing current practices. Having a measurement could provide reaffirmation in what steps school educators have taken. It could also take measure the present culture in the organization to see the strength of its PLC.

The purpose of this study was to validate the development and design of the Learning Community Culture Indicator (LCCI). The LCCI is an instrument that provides a multidimensional measure of how schools are functioning in the implementation of school cultural change focused on teacher and student learning. The LCCI was founded upon ten elements of professional learning communities that were identified in the literature. The research team of Williams, Matthews, Stewart, and Hilton (2007) created the LCCI based on the ten elements that were found throughout the scholarly and authoritative literature on PLCs, which will be identified in chapter 2. As a team that created the LCCI, we tested the instrument through multiple validation phases and refined the LCCI as it was administered and re-administered in

schools. This study filled a deficit of validated educational measures of PLCs and provided a reconceptualization of PLCs by providing a new model and method of measuring that model.

In this chapter, we discuss the background of PLCs, offer a list of 10 PLC elements, and give two problems that exist among instruments used to measure PLCs. We also present the research questions, the rationale for the study, and the definition of terms that are used throughout this study. We conclude this chapter with a framework for subsequent chapters.

Background of Professional Learning Communities

Many researchers and experts (DuFour & Eaker, 1998; Fullan, 1992; Hord & Hirsh, 2008; Olivier, 2003) have promoted PLCs in schools as one of the most successful strategies that schools can use for improving student learning. These educational reformers are looking to schools to function as communities with collective cultures that include organizational purpose and collaboration. According to these reformers, the idea that a school functions as a PLC has potential for creating schools that are self-directing, self-adapting, and resistant to the needs of those reforms that advocate more immediate and sweeping changes. Although several reformists have contributed to this reform movement, none of them has attempted to unify all efforts into a single model. Having no common conceptualization of PLCs and no means to measure whether schools that claim to be PLCs are functioning as such can be problematic for research and practice. Many schools that refer to themselves as PLCs might have only the appearance of being one because they have adopted such structures as having teachers organized into teams with little attention to some of the more critical aspects of PLCs such as a focus on student learning, common assessments, data-driven decision making, or job-embedded professional development. Without these substantive aspects of PLCs included in the way teacher teams function, these schools might not achieve the promised sustainable improvement in student learning. Thus,

teachers might get discouraged and burned out, convinced that PLCs are just another empty claim for how schools can improve. Unfortunately, this perception not only damages the schools that have implemented PLCs poorly, but it inhibits the progress of schools that are endeavoring to implement PLCs at the deep cultural level.

If a common definition of what constituted a PLC was crafted and if a validated means for measuring it was devised, implementation efforts would be enhanced. Implementers would have a clear vision of the elements that are present in the culture of high-functioning PLC schools. They could also collect empirical data that showed which elements were present in their schools and which were not. They could then use that data to guide the development of their school PLCs more strategically in the future; thus, they would substantially increase the likelihood of improving teaching and learning in their schools.

Although certain PLC concepts have been studied extensively (Blankstein, 2004; DuFour, DuFour, Eaker, & Many, 2006; Hord, 1997; Louis & Marks, 1998; Senge, 1990; Senge, et al., 2000), providing an explicit list of all the essential elements of learning communities is not present in the literature. This problem, unfortunately, has presented difficulties for schools that are attempting to measure their current implementation. Measuring existing implementation levels and attempting to begin new strategies for improvement with the PLC concepts are difficult for schools when there is no consensus on defining elements and instruments that can measure those elements.

The PLC movement began a cultural shift toward systematic teacher collaboration that was focused on improving student learning. This focus on student learning was a departure from many earlier reform efforts that were occupied only with the teacher and teaching (Levin & Wiens, 2003). However, explicitly defining PLCs was problematic because of their universal

application while simultaneously having uniqueness for each school (Smith, MacGregor, Matthews, & Gabelnick, 2004). In other words, PLCs function differently in each school because of a customized application to the needs and culture of that school (Smith, et al., 2004). The PLC is initiated, developed, and led by members of that school's community (Hord, 2004).

As with most bodies of knowledge, the PLC movement grew over time as new members joined in the academic conversation (Graff & Birkenstein, 2006; Whetten, 1989). Many researchers and practitioners provided different definitions and elements of PLCs. Until now no consensus has been attempted to combine them into a unified model. Many researchers and reformists have studied single elements and their benefit to schools, but no comprehensive list of elements has previously been assembled and studied.

With my colleagues on the research team, we identified a common list of PLC elements that has been identified through an extensive review of the literature and study of schools that have implemented PLCs (Williams, et al., 2007). We identified ten common elements among the PLC and school reform literature, namely:

1. Common mission, vision, values, and goals that are focused on teaching and learning
2. Decision making based on data
3. Participative leadership that is focused on teaching and learning
4. Teaming that is collaborative
5. Interdependent culture
6. Academic success for all students with systems of prevention and intervention
7. Professional development that is teacher driven and embedded in daily work
8. Principal leadership that is focused on student learning
9. High-trust embedded in school culture

10. Use of continuous assessment to improve learning

This list of PLC elements is the foundation upon which we created the LCCI (Williams, et al., 2007). The LCCI was initially created to assist in measuring PLC levels in schools that belonged to the partnership school districts and the Brigham Young University (BYU) Principals Academy. The BYU Principals Academy is a two-year course of study for principals who want to develop PLCs within their schools. At the end of the two-year academy, many principals expressed a desire to determine if what they had begun to implement in their schools was actually present. They wanted to measure the degree to which their schools were functioning as a PLC. We first considered an existing measurement that was developed by Hord (1997), and we found that her instrument did not include many of the elements learned by the principals in their study of PLCs. Through an extensive review of the literature, we found ten elements that identified a PLC and began to build an assessment around those elements. These ten elements also formulate the conceptual model of the LCCI, which will be discussed in the next section

Conceptual Model of the LCCI

By using the conceptual model of the LCCI with the ten elements of PLCs, we established a measurement in which schools that are attempting to implement PLC strategies can assess their progress (Williams, et al., 2007). This model is more than a summation of other authors' work. It is the creation of a new model, which proposes that there are ten elements unique to other authors' PLC elements. The elements are different and distinct among themselves. By using the model, it is proposed in this study that the LCCI's items within each PLC element are independent of one another and measure separate constructs. For example, the statements within the element "Teaming that is Collaborative" should only measure that construct and not measure constructs within another element such as "Decision Making Based on

Data." We also propose that not only can each PLC element be measured but that the LCCI can measure an overall level of PLC implementation. The overall measure is derived from the combination of the results of individual elements. In other words, in this study we will show two things: one, each question measures the individual element for which it was created, and two, all questions together provide a single measure for a level of PLC.

Although many surveys have been created and used to measure some aspect of school culture, only two groups of researchers have attempted to measure PLC elements using a validated measure. Shirley Hord (1997) created an instrument founded on her five elements of a PLC that was validated by an external organization called The Evaluation Center (1998). In this validation, only one school that was known to be a functioning PLC was sampled. This school was compared to 21 other schools that had no known level of PLC within those schools. Although, Hord's instrument was validated, and it proved to provide some measure of PLC levels, the instrument was limited to her five defining elements of a PLC. Another instrument, which essentially was a modified form of Hord's instrument, was created by Huffman, Hipp, and Olivier (2003). The Professional Learning Community Assessment (PLCA) was an extended version of Hord's (1997) 17-item survey. While some validation and reliability were conducted, although not presented in the literature, this instrument again was limited to the five elements of Hord's model. The limitation of these two instruments is problematic for schools that may be implementing other models of PLCs, such as DuFour's, Blankstein's, or Louis and Kruse's. At a recent national conference, Hord admitted that her instrument was outdated and needed to be revalidated (personal communication, NSDC Conference 2008). Also in a recent conference paper presentation, Olivier and colleagues (2009) presented a modified PLCA instrument that included two new questions regarding data utilization as encouraged by the additional work of

Hord and Hirsh (2008). However, this instrument also has limitations because it only measuresd Hord's model of a PLC and does not consider the other PLC models.

Statement of the Problem

In order to frame the difficulty and substantiate the need to conduct this research, we emphasize two problems. The first problem is a lack of consensus among PLC experts and their defining elements that make up a PLC. Thus, confusion exists in the field as to which elements are essential to the development of a PLC. In order to assist school leaders in the development of a PLC, consensus must exist as to which elements are important in establishing a PLC. Likewise, a consensus of which elements that are identified in the literature are essential to PLCs would also provide a foundation for further empirical research and provide substantiation to the claims of PLCs and their success. By identifying the elements that are common among authors of scholarly and authoritative literature, a common language can be used to study and implement PLCs.

The second problem is the shortage of a current and psychometrically validated instrument to measure PLC concepts that have been implemented by schools and the degree to which they are functioning within those elements. As mentioned above, before the LCCI, only Hord's (1997) and Huffman, Hipp, and Olivier's (2003) validated instruments were found in the literature. However, the validation of these PLC instruments was limited in that the validation occurred only once and the instruments were founded only on the defining elements of Hord's model (1997). By considering only Hord's elements in the creation of the instrument, the surveys were limited in providing measures of PLC implementation only to those schools that adhere to Hord's model of a PLC. However, for those who may be utilizing a DuFour model of PLC

within their school (DuFour, et al., 2006), there has been no validated instrument that can measure PLC levels of implementation in that school.

In this study, the first problem helps to frame the second problem by establishing justification for validating a survey to measure PLCs. Acknowledging the first problem that there is disunity among the authors of PLC elements establishes the reason for the unifying 10 elements. In order to address the second problem, we will discuss the purpose for this study in the next section.

Purpose of the Study

This study had two purposes. The first purpose was to present the development of a new instrument to measure school levels of PLC, which may lead to a greater understanding of the defining elements of a PLC and provide a means for schools to assess their level of implementation. This instrument is an attempt to provide a new conceptualization of PLCs by providing a new model in how PLCs are identified and studied.

A second purpose of this study was to test the validity of the LCCI. Messick (1995) described validity as "an overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions …[in] modes of assessment" (Messick, 1995, p. 741). Validity represents how accurately an instrument measures the constructs it was intended to measure. We conducted this study to test the validity of the LCCI in its goal of measuring multiple elements of a PLC.

Although the purpose of this study was to present the development and validation of the LCCI, we hope that the primary benefit of this research is an improved understanding of the constituent elements of PLCs and the ways to assess them within schools. Providing this understanding may offer critical information for educators and leaders as they implement PLCs

within their schools to improve student learning. The developers of this instrument anticipated that the results of the validation would also show a sound, well developed, and valid measure of PLCs. This instrument will provide empirical evidence on which leaders will be able to assess their success in establishing PLC elements in their schools and to plan for the next steps.

Research Questions

There are two specific problem areas outlined in this study: lack of consensus among PLC experts and their defining elements that make up a PLC, and the lack of a validated instrument to measure schools that have implemented PLC concepts. In order to address the problems identified by this study, the following three research questions guided this research:

1. Does the LCCI measure unique individual elements of PLCs?
2. Does the LCCI measure an overall level of PLC?
3. Is the LCCI a valid and reliable measure of PLCs?

Definition of Terms

The following terms are used throughout this study. They are defined as follows:

*Confirmatory factor analysis (CFA)*is a type of structural equation modeling, that is used in the testing of measurement models and the relationships between observed and latent variables (Brown, 2006). These variables are called factors.

Culture. The culture of an organization is the shared beliefs or patterns that have arisen from encountering and solving problems faced by the organizations (Schein, 1984). It is also the way things are done within an organization (Bolman & Deal, 1997).

Exploratory factor analysis (EFA) is a descriptive technique of the data before a CFA that attempts to measure the number of common factors in a data set and to which latent variables or factors they may belong (Brown, 2006).

Factor Loading are a statistical estimate of the presumed effects of the latent variables on the observed scores (Kline, 2005) measured in CFA as regression coefficients.

Goodness-of-fit indices are a statistical measure of how well the proposed or hypothesized model within a CFA fits the resulting data.

Learning Community Culture Indicator (LCCI) is a self reported questionnaire and school culture survey taken by teachers and principals and used to measure 10 PLC elements and their level of implementation within schools.

Learning Organizations are continuously learning and applying experience into knowledge to help accomplish a common purpose (Senge, 1994).

Measurement Error is variance, or residual errors, that are not explained by the latent variables or factors by the indicator scores (Kline, 2005).

No Child Left Behind (*NCLB)* Act of 2002 is a federal act mandating student improvement and increasing school accountability through out the United States. The NCLB Act was a reauthorization of the ESEA act of 1965.

Professional Learning Community (PLC) is a current school reform that shifts the focus and culture of the school to be highly centered on all students and teachers learning together through elements such as collaborative teaming, interdependent culture, and participative leadership.

Reliability is a measure of the degree to which a test is free from measurement error (AERA, APA, & NCME, 1999). The internal consistency, an estimate of reliability, is the degree to which a group of survey questions measures a single concept.

Validity is a measure of the degree to which a survey has evidence that supports the inferences made from the scores (AERA, et al., 1999). Categories of validity include construct validity, content validity, criterion-related (concurrent) validity, and face validity.

Summary and Organization of Chapters

The organization of this introduction began with a discussion of PLCs, the constituent elements, and problems among PLC authors. The ten elements identified by Williams and associates (2007) provided the framework for the creation and structure of the LCCI. In chapter 2, we present a review of the literature of the standards and measures of validity and reliability, school culture, origins of learning communities, and school reform. Each of the ten elements will be reviewed individually and compared with five prominent authors of PLC elements. In chapter 3, we present the methodology for addressing the validity and reliability of the LCCI and how testing the theoretical model was created. In chapter 4, we present the results from the three phases of development and validation, and in chapter 5, we discuss the implication of the results we observed and propose recommendations for further research.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction to the Literature Review

Since the creation of free public education in the United States, the function and purpose of education have changed. Many events, individuals, and situations have promoted changes hoping to make education more effective for a greater number of students. Some periods were stagnant where many repetitive practices of unproductive actions in schools had prompted individuals to promote change. Some governmental legislative acts were events that required change. Change was quick and sometimes painful. Recently in the wake of many publications and governmental acts calling for change, educational researchers and practitioners were looking for types of reform that would be sustainable and linked with student learning.

Some reforms in the first decade of the 20th century were looking for schools to function as learning communities with collective cultures of organizational purpose and collaboration. Proponents claimed that the idea that schools function as learning communities had potential for creating schools that were self-directing and self-adapting. Although some authors contributed to this reform movement, nothing in the literature suggested that any attempt had been made to unify all efforts into a single model of success. By synthesizing the best ideas and thoughts on learning communities from educational researchers and practitioners, we hope to report that a newly developed school reform tool has been developed to help educators in their quest for improving learning for all students.

In the past decade, learning communities (also known as professional learning communities [PLCs]) were often touted as the "most promising strategy for sustained, substantive school improvement" (DuFour & Eaker, 1998, p. xi). Many authors attested to the

potential success of implementing learning communities in schools to enhance student achievement (Blankstein, 2004; Darling-Hammond, 2005; Hord, 1997; Louis & Marks, 1998; Rait, 1995; Senge, et al., 2000; Stoll, Bollam, McMahon, Wallace, & Thomas, 2006). However, a problematic aspect of learning community literature was the lack of consensus among learning community authors (Wells & Feun, 2007). Because of the lack of empirical studies and different defining elements, the support for professional learning communities was often limited to anecdotal stories.

For this study, we reviewed the contemporary authoritative and scholarly literature on reforming and improving schools and measurement validation. We reviewed empirical studies and primary research articles to find connections among the topics. We also reviewed secondary research to provide a foundational base for this research. In this chapter, we will present a review of measurement validation and show the need for the Learning Community Culture Indicator to be a validated instrument. We reviewed how organizational culture was defined and measured in the literature. We focused on the origins of learning communities and common elements identified by PLC scholars and experts. We also present a review of the literature on the school reforms that have affected professional learning communities. We will also discuss the implementation of the professional learning community concept as a reform effort in schools. We will then focus on school reforms and present how some have fallen short of success, and then present a movement that has found success in improving student learning. Finally, we conclude with an analysis of the literature.

Need to Validate the LCCI

Using the ten elements found in the literature, the research team of Williams, Matthews, Stewart, and Hilton (2007) created the Learning Community Culture Indicator (LCCI). The

LCCI is a school survey instrument used for determining the level of implementation of ten PLC elements identified in the literature. In order to substantiate the application and truthfulness in which survey instruments measure the constructs upon which they are created, a standard of validity was needed for the instrument (Messick, 1995). Below we provide a review of measurement validity, reliability, and why they were essential in substantiating survey instruments' claims of accurately measuring a concept.

Types of Measurement Validity

In education and other social sciences, many researchers developed instruments in an effort to measure an observed or unobserved concept. If researchers hope to infer any substantial conclusions from the data collected by instruments, they must first establish whether the instruments are accurate measurements of the concept. The determination of how well the instruments measure the concept is known as its validity. Validity has been referred to as the "degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests" (AERA, et al., 1999, p. 9). It has also been defined by Messick (1995) as an "overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions on the basis of test scores or other modes of assessment" (p.741). In multiple instances, validity was not held in the properties of the test but to the meaning of the test (Cronbach, 1971; Messick, 1995; Shepard, 1993). Validity was not solely based on the structure and wording of the instrument but on what results were produced from the measurement. It is through the analysis of the results that validity was determined.

The constituent elements of validity include content, criterion, construct, and face validity. In the following section, we describe each element and relevant measures addressing how that validity was determined.

Content Validity of Instruments

Content validity is defined as the degree to which an instrument measures all pertinent characteristics of the behavioral or conceptual domain that the instrument was created to measure. Traditionally, content validity relied on subjective judgments of an instrument's ability to measure a content (Bryant, 2000). Researchers commonly determined validity by visually inspecting the items and their thoroughness in covering the content. Some researchers such as Brown (1983) believed that there was no method statistically to measure validity. He stated, "Since no quantitative index of sampling adequacy is available, evaluation will necessarily be a rational, judgmental proves" (p. 69). In the past, researchers thought there was no way to quantitatively measure the validity of an instrument. Researchers now use methods of multivariate statistics to determine the content an instrument attempts to measure.

Using methods such as exploratory factor analysis (EFA), principal component analysis (PCA), and confirmatory factor analysis (CFA), researchers have been able to measure what is known as structural validity. EFA is typically conducted before performing a CFA. CFA tests the hypothesis of a model, proposed by the research being conducted, on the domains of study in a measurement. The hypothesis tests a model on which the researcher has predetermined which items measure which domains and how well they correlate (Bryant, 2000). Goodness-of-fit indices are measures within a CFA that determine support of the instrument's validity. The goodness-of-fit is a measure of how fitting the model is in representing the results of data. Does the model fit with the results? As a model adjusts, goodness-of-fit measures can be compared to

see which is the best fitting model. A strength of the CFA is its ability to decide how well a model may generalize across groups of individuals. Another strength of CFA is that it gives a stronger framework than traditional techniques in accounting for measurement error (Brown, 2006).

Criterion Validity of Instruments

Criterion validity is related to how well an instrument can predict a known indicator of a concept (Bryant, 2000). If the instrument is well designed in measuring its intended concepts, it should be able to predict outcomes of the concept. This is referenced as predictive validity. It is predictive in the sense that it informs about future results. Predictive validity is often used when scores are collected in measuring an established criterion. Evaluating the predictive validity will confirm that the expected scores will reflect the criterion it was intended to measure.

Another component of criterion validity is concurrent validity. The concept is concurrent in the sense that it produces similar results to another measure of the same concept. Concurrent validity is often used in establishing consistency among instruments measuring the same concepts. Evaluating the concurrent validity will confirm that the scores obtained did reflect the criterion the measure was intended to measure, and that the measure was similar to the result produced by another measure of the same criterion. Concurrent validity is usually assessed using another statistical procedure known as structural equation modeling (SEM).

In SEM "the researcher uses multiple measures as indicators of both the underlying construct to be validated and of the criterion construct, and then estimates the causal influence between the two latent constructs" (Bryant, 2000, p. 108). SEM is a relatively new statistical technique in which a researcher can test a theory about causal relationships among concepts.

EFA does not allow causal relationships to be tested because it is exploratory in nature, therefore the researcher must continue by using SEM as a method to confirm the findings of the EFA.

Another form of structural analysis similar to SEM is path analysis. However, path analysis only deals with observed rather than latent variables (Klem, 2000). SEM has combined elements of both factor analysis and path analysis. CFA is a type of SEM that is specifically focused with relationships between latent and observed variables or measurement models (Brown, 2006). These potential relationships can be confirmed through the building of models to test the relationship between the observed and unobserved variables.

Construct Validity of Instruments

Often considered by researchers as a culminating conception of validity (Shepard, 1993), construct validity is an element of test validation. Construct validity determines whether a given measurement actually measures the conceptual constructs the instrument is attempting to represent (Bryant, 2000). Constructs are the conceptual elements or characteristics that a measurement hopes to gauge. As with the validation process, validity is not of the test, but the explanation of the data that were collected by the procedure (Shepard, 1993). The *Standards of Educational and Psychological Measurement* (AERA, et al., 1999) defined validity as "the process of … accumulating evidence to provide a sound scientific basis for the proposed score interpretation" (p. 9). The purpose of validity is whether a measurement is capturing the ability to interpret some determined construct, thus establishing why construct validity is often considered a culminating conception of validity.

Construct validity has two components. The first component is an internal structure where the internal model of the measurement should represent the theory that was used in defining the construct (Shepard, 1993). This can be measured using the SEM to assess the

structural validity of the instrument and the model upon which it was built. The second component is the external. The external focuses on the framework's representation of the intended model or constructs and their relation to other constructs outside of the model. The representativeness of the measure in relating to other constructs is important in determining the validity and application of the instrument. If, for example, a measure is used to determine the view of teachers on the importance of parent input, the measure should be somewhat related to the parents' input on school or student matters.

Within construct validity, there are two sub measures termed convergent and divergent validity. Convergent validity is the degree to which multiple measures of a similar construct converge or agree (Bryant, 2000). If within a test, multiple questions are attempting to measure the same related concept, the questions should have a greater convergent validity if they intend to measure that concept. A CFA would be used to assess the convergent validity of a measure. Another gauge in determining convergent validity is comparing it to its counterpart, divergent validity.

Divergent validity is a measure of whether questions from an instrument attempting to measure different constructs are dissimilar or divergent. If multiple constructs are attempting to measure different ideas within the same measurement, they should not be highly correlated. If they were highly correlated, the concepts would be measuring the same concepts. Divergent validity can also be assessed using a CFA by comparing models of convergence and divergence. A convergent model theorizes that there is a single latent construct being measured in comparison to a divergent model that theorized that there are multiple separate constructs being measured. Using goodness-of-fit indices to compare both models, the researcher can then determine which model represents the data better.

Traditionally, models of CFA were considered unidimensional in that they travel one path of convergence or divergence. However, another model exists in which there can be a simultaneous testing of both. This type of model is called a bifactor model. The bifactor model is commonly compared to traditional hierarchal models of comparison (Chen, West, & Sousa, 2006; Reise, Morizot, & Hays, 2007).

Face Validity of Instruments

Although not a true measure of construct validity, face validity is a related measure. Face validity is often considered a domain of criterion validity (Bryant, 2000), however in this review, it will be addressed individually. Face validity does not attempt to determine the degree to which an instrument measures a concept. Face validity does attempt, however, to represent consistently the construct being measured by those taking or developing the instrument. Face validity is subjective and based on the interpretation of those reading the measurement and determining whether superficially it captures what it intended to measure (Bryant, 2000). Face validity is not an attempt to determine the actual construct validity, and in some cases, it may not posses any, but it is determining if the measure's wording, questions, and relevance are trying to measure a known construct.

Evaluators should consider multiple elements when evaluating the validity of a measurement. Within each element, there are also methods or techniques to determine the degree to which the measurement meets the criteria of each element of validity. Establishing the validity of an instrument will substantiate the claims of those who are using the information in their research.

Reliability of Instruments

Another related measurement of tests and how accurate they are in assessing a predetermined idea is reliability. Reliability is defined as the "trustworthiness of a measure" (Strube, 2000, p. 63). Similar to validity in the sense that it tries to capture a true value of some concept, reliability is a measure of consistency of the questions on a test measuring the same concept. Reliability is not related to validity in the sense that reliability does not depend on the questions as being a valid measure of a construct, but only whether they consistently measure the same idea (AERA, et al., 1999). Reliability is essential to validity, but validity is not essential to reliability because researchers can consistently measure the wrong concept.

Another facet of reliability is the measurement's stability over time and with different sample populations. The *Standards* (1999) defined reliability as consistency of a measurement when the testing process is repeated on a population of groups or individuals. The goal in achieving reliability is the reduction of measurement error. Measurement error is part of the observed score that represents the imprecision in capturing the true score (Strube, 2000).

An essential element in many measurement instruments is how consistent each of the items in the test measures the same characteristic. This interrelationship among the various items on a measurement is termed internal consistency (Brown, 1983). A common measure of internal consistency, which is often used in determining reliability among test questions, is Cronbach's coefficient alpha. Cronbach's alpha is the expected correlation of one test and another of the same length taken from the same domain (Brown, 1983). It is measured on a scale of 0 to 1.0 with 0 having no internal consistency and 1.0 having a perfect consistency among the test items. Many factors can influence the reliability coefficient. These factors are test length, range of

scores, test difficulty, time length, wording, and sentence construction (Brown, 1983; Strube, 2000).

Validity and reliability are domains within measurement validation that are important in providing levels of accuracy and consistency of tests in assessing some intended concept. They provide credibility to researchers' claims after they have collected and interpreted data. Gathering data is essential for researchers. However, gathering accurate and true representations of the perspectives, characteristics, or knowledge of test subjects is even more essential.

Reforms of Contemporary Organizational Culture

Arising in the early 1980s, organizational culture emerged as a new concept. At the time, organizations were analyzing the reasons the U.S. was underperforming when compared to some other countries. Organizational researchers learned that in order to be competitive in the external environment, the focus of change began with the understanding of the organizational culture (Daft, 2005).

Schein (1984) defined organizational culture as "The pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems…to be taught to new members as the correct way to perceive, think, and feel in relation to those problems" (p. 3). This definition then leads to an accepted and valid way of dealing with problems that can be conveyed to a new employee of the organization. According to Schein, a culture stems from artifacts, values, and assumptions that are both visible and self-evident. Schein believed that because culture is typically taken for granted by the members of the organization, assumptions of the culture are not typically revisited unless in times of turbulence. However, currently revisiting culture is not limited to times of turbulence but can also occur because of the needs of federal, state, and district educational systems.

The understanding of organizational culture in business has provided a foundation for researchers to apply the same understanding to education. Many researchers began studying how culture influenced the school. Peterson and Deal (1998) defined school culture as "the underground stream of norms, values, beliefs, traditions, and rituals that has build up over time as people work together, solve problems, and confront challenges" (p. 28). The following section will provide a review of school culture reforms and how culture can be observed.

Review of School Culture

Any school reform effort and change are only lasting if the culture of the school changes (Peterson & Deal, 1998). To facilitate change, the culture can be studied and shaped by school leaders and members of the organization (Deal & Peterson, 2000). Deal and Peterson stated that leaders could act out different roles such as historian, actor, or healer to shape and understand the school culture.

Cultural change can occur from new events or needs in the organization. Just as culture can influence day-to-day functions, culture can also influence school reforms. School leaders can study their schools' culture to assess whether reform implementations are taking root (Gruenert, 2000). Cavanagh and Dellar (1998) observed that leaders who ignore their school's culture are less likely to have the needed skills to change a culture and may be in opposition to needed interventions. Understanding and diagnosing a culture would provide school leaders with essential information in their journey of implementing and sustaining changes within the school.

The term culture is a latent concept in that it is not directly observable. School members cannot look at a school and instantly determine the culture. However, culture can be studied by the manifestations that arise from the elements. These manifestations are sometimes called "footprints" (Gruenert, 2005, p. 45) of a culture. Because of the latency of culture, many

researchers have developed, designed, and modified existing surveys in an attempt to measure particular aspects of school culture (Goddard, Goddard, & Tschannen-Moran, 2007; Gruenert, 2000, 2005; Hord, 1997; Lee & Smith, 1996; Newmann, Smith, Allensworth, & Bryk, 2001; Supovitz, 2002; Wells & Feun, 2007). These instruments have measured multiple concepts within schools. The results of the surveys have been analyzed to draw some conclusion about school culture. The next section will present how researchers have analyzed and measured school culture using instruments.

Analysis of School Culture

Collaboration, teaming, instructional coherence, professional communities, and learning, all components of school culture, have been measured using cultural survey instruments. Although these surveys have various levels of validation, the authors of these surveys have connected culture to influence on school performance. Lee and Smith (1996) selected specific questions from the National Educational Longitudinal Study to measure the collective responsibility of teachers in a school. Another group of researchers (Newmann, et al., 2001) attempted to measure instructional program coherence using a self developed survey. Hord (1997) developed a survey attempting to measure school cultures focused on PLCs. Wells and Feun (2007) modified Hord's instrument by using only 16 questions to measure culture of schools attempting to become PLCs. Olivier and others (2003) also modified Hord's instrument by adding an additional element and increasing the question length to 45. For his studies, Gruenert (2000, 2005) used a survey based on six elements of a school collaborative culture. Some surveys were as small as five questions (Goddard, et al., 2007), and others as large as 88 (Lee & Smith, 1996).

Only a few authors addressed the statistical validation of their survey instruments. Some authors made inferences about student achievement, teacher perceptions, cohesiveness, and school operations, and how culture influences these areas. Observing culture through surveys has provided a means for researchers to compare a perception held by the school with some factor of school design, and then to draw conclusions about the influence of that school design on the school perception. Many surveys have been developed with only that author's definition of the concept, thus neglecting other definitions of the same concept. Some researchers have measured the culture of a school based on the survey creator's elements, but the school is implementing another author's different definition. A specific reform that is focused on cultural change is PLCs. Although many instruments exist to measure culture, only a few measure PLCs.

Measures of Professional Learning Communities

Among the many instruments that measure the culture of schools (e.g., Goddard, Goddard, & Tschannen-Moran, 2007; Gruenert, 2000, 2005; Lee & Smith, 1996; Newmann, Smith, Allensworth, & Bryk, 2001; Supovitz, 2002; Wells & Feun, 2007), an extensive review of the literature revealed only two specifically measure school cultures of a PLC. Founded around her five elements, Hord's (1997) instrument was 17 questions in length and had only one known validation, which was conducted in 1998 by a separate organization. Another existing survey, although a modified form of Hord's instrument, was Huffman, Hipp, and Oliviers's (2003) PLCA. The PLCA is 46 questions in length, and was based on Hord's (1997) five elements. Some statistical validation of the PLCA was conducted, although only alluded to in the literature, which produced an acceptable level of validity and reliability. Williams, Matthews, Stewart, and Hilton (2007) recently created the LCCI as an instrument that measured PLCs based on ten common elements that were identified in the scholarly and authoritative literature on PLCs.

Overview of School Reform

In the next section, we present a review of the literature on school reforms and how the reforms led to the emergence of PLCs. The first section addresses the idea of community, and how schools reformed to develop cultures of community.

School Reforms as Communities

From the origins of free public education, schools have been the proving ground of intended change or reform. Common schools reformers such as Horace Mann, Francis Parker, and John Dewey began in the middle to late 1800s pushing for standardization of education and public control (Lubienski, 2001). Mann's push for a free education of children was guided by his desire to increase the value of labor (Gelberg, 1997). By 1900, two different philosophies of education were present: an agenda of pro-efficiency modeled after the business trends of the day and "decentralized schools organization" (Gelberg, 1997 p. 13) with a focus on the individual student. Progressivists encouraged democratic ideals as a means of diffusing education among the masses. "The basic principle of democracy was that every individual be counted and treated as a person" (p. 54). Common schools and their availability to all children were then encouraged to develop democratic principles of administration and operation. One democratic ideal of the common school reformers was to view schools as communities, and functioning as a community would later become an essential element of the PLC reform.

As schools functioned as communities, the culture of the organization changed. Organizational reforms influenced how schools were viewed and provided a means for changing school cultures to learning communities. Francis Parker was described by researchers (e.g., Smith, Vaughn, & Ketchum, 2001) to have considered common schools as "communities where everyone is engaged in the educative work. . . that is best for the individual and the whole of the

group" (p. 297). Parker (1894) described public schools as a place where schools "shall work together under the highest and best conditions in one community" (p. 420). This focus would later become prominent as schools united to work together as learning communities.

John Dewey (1900) saw schools as communities where an "embryonic society" (p. 32) could grow. John Dewey believed that schools were a social institution and that education was a fundamental process of social progress and reform (Cremin, 1988). The idea that schools function as cohesive units fostering productive and future citizens was a new idea to many educators. The historic traditions of the one-room schoolhouse where teachers disseminated knowledge were beginning to be challenged. Ella Flag Young, a colleague with Dewey, expanded on the idea of schools as a community in her dissertation, *Isolation in the School*. She addressed separation and isolation among school levels and that there needed to be tailored approaches and support for individuality within the community (Smith, et al., 2001). She stated that there needed to be "differentiation within a recognized unity" (Young, 1900, p. 13) rather than an involuntarily forced combination of various levels and people. Young connected the sense of community with an individualized and purposeful approach to the learning. However, there was more than just having the harmonious sense of community in a school to teach students.

This philosophy of schools acting as communities did not transfer to a more unified practice by teachers and students focused on learning until the early 1970s. It was then that educational reformers began to see schools as communities where there was a focus on learning not only from the students but also from the teachers. Richard Graham (1972) presented the work conducted by the Wisconsin Research and Development Center for Cognitive Learning in which schools were divided into sub units called learning communities. In these schools, students had

Individualized Guided Education plans that were directed by learning communities of teacher teams. The attention was on the learner rather than the curriculum. Teachers were also expected to continue learning through staff development and shared interdependence. Graham's (1972) view of teacher learning is one "which places greater reliance on their own initiative and on cooperation rather than competition" (p. 8). This new view of community was shifting from schools focused only on the progress of the student to a teacher ownership of learning with their students. However, attempting to change teachers and schools from the traditional isolationism that permeated cultures of schools was difficult. This type of large-scale organizational shift in culture became a prevalent focus after the 1970s.

This review has presented an overview of school community and reforms focused on changing school culture. The interest in changing school cultures has roots in a modern reform movement to promote change. The following will focus on the failures of school reform and frame where the PLC models began to be utilized.

School Reform Failures

As the promotion of reforms had grown, so did the reasons for failure of reforms (Elmore, 1996; Hopkins & Levin, 2000; Leithwood, Jantzi, & Mascall, 2002; McCombs & Quiat, 2002). A specific failure in urban school reform found that school districts lacked an array of resources. Specific reforms did not bring the measurable effects predicted by their more ardent supporters, and the reform effort lacked civic capacity (Datnow, Lasky, Stringfield, & Teddlie, 2006). Programs such as *Success for All* and *New American School* were labeled as failed efforts in their attempt to initiate school-wide reform models (Pogrow, 2002). Leithwood and associates (2002) found in five case studies of large-scale change efforts that there were no gains in student achievement. Levin and Wiens (2003) attributed disappointing results in many reforms to their

lack of focus on changes that were known to affect student performance in schools. Hopkins and Levin (2000) found that reforms failed because they focused on the wrong variables, failed to adopt a systemic perspective, and failed to pay enough attention to issues of implementation. Educational reform policies required student improvement but failed to focus on how that would occur. Hubberman (1992) captured this failure by stating,

> By not addressing the impact on pupils, we will have indulged in the same magical thinking as before: that adoption means implementation…that implementation meant institutionalization…that enhanced teacher capacity means enhanced pupil achievement or development…If changes in organizational and instructional practices are not followed down to the level of effects on pupils, we will have to admit more openly that we are essentially investing in professional development rather than the improvement of pupils abilities. (Hubberman, 1992, p. 11)

Cuban (1998) found that policy-making elites gauged success in reforms based on effectiveness, popularity, and fidelity standards, but practitioners would gauge success on adaptiveness and longevity. This disconnect alluded to by Cuban between policy and practice was also addressed by Elmore (2006). Elmore stated, "There is simply no way to solve the problem of large-scale improvement in educational performance without connecting policy and practice more directly and powerfully…schools simply cannot do what they are being asked to do without more explicit and powerful guidance and support for instructional practice" (p. 217). Elmore also noted that schools could not be both the cause of failure and the solution for success.

Many reforms fell short because of the lack of individuality of reforms in helping each specific school. In many cases, reform was a generic externally derived solution attempting to fix an internal specific problem (Hargreaves & Fink, 2006; Levin & Wiens, 2003; McCombs &

Quiat, 2002; Pogrow, 2002; Symonds, 2006). Moreover, most trends within a school are initiated by one or two individuals and not invested in by the school faculty (Fullan & Hargreaves, 1996). School faculties can have a large resistance to state-, district-, or school-level reform initiatives. Teacher resistance is a major factor of educational reforms' success in a school. Zimmerman (2006) found that educator willingness or unwillingness can affect the success of a school initiative that is attempted by the principal of a school. Simply having reforms implemented in a school and attempting to change the work environment can create resistance among teachers (Kelchtermans, 2005). Understanding who the resistors are and what potential resistance they have may help find success in schools attempting change. Reform efforts have had difficulty finding success when schools and teachers are not specifically considered when deciding what type of reform to implement.

Glazer (2003) found that the literature is plentiful in the examination of reform efforts and why they fail. He also called attention to the lack of research giving evidence of reforms that have succeeded and those that are noted are more anecdotal than empirical. Are there reforms in schools that have found success and can be supported empirically?

Although some reforms have fallen short of lasting success, there is a reform that succeeds in many of the previously identified issues where other reforms have failed, such as lack of individuality or lack of a connection to student learning. The learning community or professional learning community concept is heavily gaining momentum as an effective educational reform (Darling-Hammond, 2005; DuFour, et al., 2008).

Professional Learning Communities as Reform

In this section, we present a review of the existing problems in the literature of PLCs, the prominent authors and researchers of the PLC reform, and difficulties in comparing existing

models of PLCs. We conclude this section with a presentation of common elements of PLCs from the literature.

Defining a PLC is difficult because the concept has a universal application in many schools, but simultaneously the term can also be unique to each school (Smith, et al., 2004). PLCs function differently in each school as they are customized to meet the needs and culture of the specific school (Smith, et al., 2004). PLCs are initiated, developed, and led by members of that school's community (Hord, 2004). Despite the individuality of each PLC, the overarching elements are similar. Many educational researchers and practitioners have studied PLCs and their application in schools in an attempt to understand what they contribute to education. Many researchers and practitioners have provided different definitions and elements of PLCs, but no one has attempted to reach consensus by combining existing thoughts into one unified idea. Many have studied single elements and their benefit to schools extensively, but a search of the literature revealed no comprehensive list of elements. The next section will present the most prominent authors of PLCs and elements they have identified as comprising PLCs.

Authors and Elements of Professional Learning Communities

This section will focus on five authors of PLCs: Senge (1990), Kruse and Louis (1993), Hord (1997), DuFour and Eaker (1998), and Blankstein (2004). We present each of their defining elements of PLCs.

Senge (1990) described five different elements of a learning organization: shared vision, mental models, systems thinking, personal mastery, and team learning. As one of the first to promote learning organizations, Senge provided a foundation for multiple types of organizations to grow together in how they learned and operated in their respective fields. The concept of team learning was unique and provided a model for organizations to unite in a common effort to

accomplish a similar goal. He and his colleagues eventually connected these elements to schools and described how they functioned that setting in his work, *Schools that Learn* (Senge, et al., 2000).

Shortly after Senge's work was published in 1990, two educational researchers produced similar ideas in what they termed "professional communities." In 1993, Kruse and Seashore-Louis provided an introductory view of what they considered elements of PLCs. The elements were divided into two larger areas, internal structures and organizational factors. Reflective dialogue, deprivatized practice, collaboration and shared work, normative control, and socialization of new professional members were elements of internal structures. The organizational factors were school size, principal leadership, and trust. No other author specifically mentioned trust as a single element, which we will present later in this review as important to organizational success. Much of the supporting research by Little (1990), Darling-Hammond (1990), Fullan (1992), and Talbert (1991) was similar to later works by Hord (1997) and DuFour (1998), but they did not cite the work of Senge (1990), which other authors of PLCs considered foundational.

Although Kruse and Louis's (1993) initial presentation of elements was not as developed and refined as in their later work, their original PLC elements remained consistent throughout the rest of their work (Kruse, Louis, & Bryk, 1995). Kruse and Louis's work is considered to be foundational research because it was one of the first works to apply learning organizations to education and because of its contribution to PLC literature, despite other researchers working with either Kruse or Louis in further research of professional communities (Bryk, Camburn, & Louis, 1999; Kruse, et al., 1995; Louis, Marks, & Sharon, 1996).

Hord (1997) presented five elements that defined PLCs in schools: namely, shared values and vision, supportive shared leadership, shared personal practice, supportive conditions (which included physical conditions and people capacities), and collective creativity. In comparing the different authors of PLC research, Hord's supportive citations included work from Senge (1990), Louis and Kruse (1995), McLaughlin and Talbert (McLaughlin & Talbert, 1993), and Fullan (1993), thus showing what research was considered as foundational for her work.

According to Google (2009) scholars cited by numbers, DuFour and Eaker (1998) published one of the most heavily cited PLC texts to date in which they presented six elements: shared mission, vision, and values; collective inquiry; collaborative teams; action orientation and experimentation; continuous improvement; and results orientation. Unique to DuFour and Eaker at the time was that their elements began to focus specifically on improving student learning.

Alan Blankstein (2004) identified six elements that had some similarities to others, and he presented a new element that had not previously been stated. His six elements were common mission, vision, values, and goals; ensuring achievement for all students with systems of prevention and intervention; collaborative teaming focused on teaching and learning; using data to guide decision making and continuous improvement; gaining active engagement from family and community; and building sustainable leadership capacity. Of all the other contributors of PLC elements, Blankstein was the first to specifically mention the use of data-based decision making. He was also explicit in describing collaborative teaming that is focused on teaching and learning, and ensuring achievement by using systems of prevention and intervention. He was also alone in listing family and community involvement as an element, which is not addressed by other authors.

These identified experts of PLCs provided multiple conceptualizations of PLCs. Although there were some similarities among the defining elements, there was no consensus presented by a single author. Without a common conceptualization of PLCs, there were difficulties in utilizing the claims of this reform.

Rationale For a New Professional Learning Community Model

A difficulty with having multiple conceptualizations of professional learning communities is identifying and documenting a school's level of development as a PLC. Some educators in schools might declare that they are a PLC, but they have no implementation of any PLC elements that are in the literature. Other educators might be implementing PLC elements in schools and not calling themselves a PLC. In order to determine the influence of PLC elements in a school, these educators must determine if PLC practices are present at the school (DuFour, 2007). If measured at all, the presence of such elements has been identified using a survey instrument such as the one developed by Hord (1997). However, most current professional learning communities cannot be fully assessed with the Hord instrument because they are employing different elements than those developed by Hord. Hord's instrument contained five sections consisting of her identifying elements:

> The collegial and facilitative participation of the principal who shares leadership (and power and authority) and decision making with the staff (with two descriptors); a shared vision that is developed from the staff's unswerving commitment to students' learning and that is consistently articulated and referenced for the staff's work (with three descriptors); learning that is done collectively to create solutions that address students' needs (with five descriptors); the visitation and review of each teacher's classroom practices by peers as a feedback and assistance activity to support individual and community improvement (with

two descriptors); physical conditions and human capacities that support such an operation (with five descriptors). (SEDL, 2009)

The five constituent elements of Hord's instrument were Hord's identifying elements of a PLC.

Ten Elements from Williams, Matthews, and Stewart (2007) of Professional Learning Communities

In determining a list of PLC elements, Williams, Matthews, and Stewart (2007) reviewed those authors who had published lists of PLC elements. The five PLC models that were reviewed previously were the most prominent in the field of school reform using PLCs. Although other authors have also written on PLCs, Senge, Kruse and Louis, Hord, DuFour, and Blankstein were foundational and the most prolific in researching, writing, and disseminating the PLC models nationwide. Other authors (Darling-Hammond & Bransford, 2005; Fullan, 2005; Huffman & Hipp, 2003; Newmann & Wehlage, 1995; Stoll, et al., 2006) have written on PLC reform, but they have thus far provided no new identifying elements.

Using the five foundational models, Williams, Matthews, and Stewart (2007) created a list of elements that were common among the five models. They also developed other elements from established practices and observations in the field. The ten elements are summarized as follows:

1. Common Mission, Vision, Values, and Goals That Are Focused on Teaching and Learning

A mission provides the foundation for creating a vision by defining the school's core values and creating goals in accomplishing the vision (Matthews & Crow, 2003). A vision is also a "persuasive and hopeful image of the future" (Bolman & Deal, 1997, p. 315). Some theorists believe that vision is limited only to the leader (Senge, 1994), however in creating a common sense of purpose, vision can unify organizations to help reach desired goals. Many of these

theorists have written on the importance of having a vision for the organization (Deal & Peterson, 2000; Eastwood & Louis, 1992; Hoyle & Cornish, 2006; Lipton, 1996).

Stiggins (2004) suggested that schools in the U.S. have a new common mission as result of NCLB standards that all children must succeed in learning. He also claimed that despite having a common mission under a legislated act educators need to have a shared and common mission and vision developed by the faculty. In their study of the effect of professional communities on the classroom, Louis and Marks (1998) found that schools needed to have a "shared sense of purpose" (p. 545) in which consensus exists among the faculty of what the mission of the school is and how it is operationalized.

Although many theorists have promoted the need for having a vision and mission for an organization and school, empirical evidence supporting the influence of these statements on student performance is lacking (Weiss & Piderit, 1999). An additional concern is the variability in the mission statements among schools. Some missions may focus on self-esteem of the student while others focus on student learning. In their study of 304 mission statements in schools, Weiss and Piderit (1999) found evidence that mission statements can influence student performance. They discovered that when a mission statement specifically mentioned student learning, there was evidence of improvement. They also found that when mission statements focused on self-esteem of students math achievement scores increased. A troubling conclusion they came to was that schools that included the phrase "all children can learn" in their mission statements actually had a negative impact on student performance. The limitations presented in their study revealed that no information as to how the mission was developed or implemented in the school was collected.

2. Decision Making Based on Data and Research.

Research indicates that when teachers use data and research to inform their instructional practice, student learning improves (DuFour & Eaker, 1998; Halverson, Grigg, Prichett, & Thomas, 2005; Stiggins, 2004; Wall & Rinehart, 1998). In their case study of a school on academic probation, Krajewski and Parker (2001) observed that as the teachers began to disaggregate standardized test data and focus on deficiencies, they began to encourage and support students to engage in their own learning and accept responsibility for their own quality of work. This test data disaggregation eventually led to the removal of the academic probation that was placed on the school. Lewis and Caldwell (2005) wrote that evidence-based practices of school leadership were difficult, and that "the challenge for leaders is to collect and report data and be able to internalize it at the right time for the right reasons and for the right students" (p. 182). These researchers also reaffirmed the need for leaders to create and sustain learning communities that focus on a dramatic shift in decision making and their teachers' investment in research and experimentation. Halverson and Thomas (2007) stated, "Schools and districts have faced growing pressure to use data for improving student learning. These pressures have come from the high-stakes accountability requirements of NCLB and from research supporting the use of data-based decision making" (p. 19). The potential benefits from this focus and pressure could help identify students before they fail and perhaps change how educators view teaching and learning. According to Blankstein and DuFour, using research and data-based decision making is crucial in facilitating collaboration, participative leadership, and guiding instructional decisions

3. Participative Leadership That Focuses on Teaching and Learning

Many researchers believe that in professional learning communities, teachers participate in making decisions relating to teaching and student learning in substantive ways (DuFour, 2001; Hord, 2004; Louis & Kruse, 1996). Spillane (2005) defined leadership as an organizational

quality rather than an individual attribute. He also classified leadership as a product of interactions between leaders, followers, and situations.

Democratic leadership, teacher leadership, distributed leadership, school leadership, collective leadership, and teacher empowerment are terms that are often used synonymously to describe the practice of involving teachers in the decision-making process within a school's framework (Cameron, 2005; Clift, Johnson, Holland, & Veal, 1992; Hart, 1996; Spillane, 2005; Spillane, Halverson, & Diamond, 2001). The term "participative leadership" used by (Smylie, Lazarus, & Brownlee-Conyers, 1996) encompassed the broad spectrum of teacher leadership. In their study, these researchers found that "school-based participative decision making" (p. 194) was not effective unless part of systemic wide reform of curriculum and instruction. Smylie and his colleagues also found that this type of decision making at the school level was dependent upon frameworks, training, and professional development established by the district. Other researchers (Blase, Blase, Anderson, & Dungan, 1995; Heller & Firestone, 1996). have addressed the importance of teacher leadership and its benefit to schools.

In building a PLC, teacher leadership is fundamental. DuFour and associates (2008) stated, "Individual leaders must have allies if they are going to establish and pursue a new direction for their organization" (p. 123). Louis, Kruse, and Marks (1996) found that professional communities prosper in schools that are flexible in the decision-making process with instructional issues, such as school-based decision making versus top-down mandates. Hord (1997) admitted that teacher leadership was not a new factor in school change efforts to become a PLC, but an essential one. As seen in the literature, empowering teachers to become agents in the direction of the school will provide added strength to the development of a culture of learning.

4. Teaming that is Collaborative

Teams can function in many different ways, such as planning school parties, making school governing issues, or aligning instructional practice of teachers similar in content or grade. Interdependence is a collective ideology held by members of a school faculty that is establishing a learning community, but it is through teaming that the belief becomes action. The collaborations of the team have the greatest influence for improvement in classrooms and the school (Goddard, et al., 2007).

Many reforms that involved teaming within schools have found success in student learning. Newman and colleagues (2001) found that school improvement efforts that focused on instructional program coherence had increased student performance. Other successful reform efforts studied by other authors (Cooper, Ponder, Merritt, & Matthews, 2005) attributed their success, in part, to aligned curriculum within regular department meetings. Another study (Hunt, Soto, Maier, Muller, & Goetz, 2002) found that providing increased social support for students with teams that had a unified support plan found greater academic success for severe special education students. Stewart and Brendefur (2005) observed that teams that focused on improving day-to-day instruction using lesson study were more willing to take risks with lessons and open their instructional practices to the team. Supovitz (2002) stated that "the success of teaming therefore appears to depend on its ability to not be merely an organizational or structural reform but one that promotes and supports changes in how teachers teach" (p. 1599). After accounting for demographic characteristics, Supovitz also found that students of teachers who were on teams with higher use of group instructional practice did better than students of teachers who were on

teams with low levels of group instructional practice. He also identified three attributes in teacher teams whose instructional practice influenced student performance: First, they prepare for instruction collaboratively; second, they teach each other; and third, they group students to take advantage of strengths of team members and small group instruction. Goddard and his colleagues' (2007) work on the affects of collaboration on student achievement showed that teacher collaboration for school improvement was significant as a positive predictor of differences in student achievement among schools. In schools attempting to implement PLCs, Well and Feun (2007) saw a major shift in each school as teachers began to collaborate in instructional teams who taught the same content.

Many PLC authors attested to the essential function of teaming in their identifying characteristics. Senge (1990) listed team learning, Louis and Kruse (1993) identified teaming as collaborative-shared work and reflective dialogue, Hord (1997) identified collective creativity and learning as teaming functions, and Blankstein (2004) explicitly identified an element as collaborative teaming focused on student learning. Teaming is a necessary structure and action the school takes to help focus on the learning of students.

5. Interdependent Culture That Sustains Continuous Improvement in Teaching and Learning

Principals, teachers, aides, students, and parents are all actors within a school culture, but how they interact is the critical piece toward building a positive culture (Peterson & Deal, 1998). A positive culture in this review is the interdependence of key actors within a school culture as they focus on improving student learning. Senge (1990, 1994) termed this element of organizational learning as system thinking or thinking that "encompasses a large and fairly amorphous body of methods, tools, and principles, all oriented to looking at the interrelatedness of forces, and seeing them as part of a common process" (p. 89). Lee and Smith (1996) termed

this interdependence in schools as a collective responsibility among the faculty for student learning. They described it as how teachers define their work; how they interact with students, teachers, and superiors; and how they control their work. Lee and Smith (1996) claimed that teachers must have shared norms that specifically focus on learning. They stated, "Cooperation among teachers makes schools both more effective and more equitable environments" (p.131). Lee and Smith found that in schools that had high levels of collective responsibility across the entire faculty, students learned more in all subjects. Gruenert (2005) reported that collaborative school cultures have elements of interdependence such as joint work, mutual support, and agreement on educational values. He went on to find that the more collaborative the school's cultures the more likely they were to have higher student achievement.

Gajda and Koliba (2007) addressed the idea of interdependence as a form of intra-organizational collaboration by stating that "the individual members of a social learning system share common practices and work together to achieve mutually desired outcomes" (p. 27). They also described intra-organizational collaboration as interpersonal practitioner collaboration. In professional communities, Louis and Marks (1998) characterized the idea of interdependence as deprivatized practice. They identified deprivatized practice as openness of one's practice to observation, scrutiny, and analysis. When teachers share strategies with one another, they can become experts together (Bryk, et al., 1999). DuFour, DuFour, Eaker, and Many (2006) claimed that members of a PLC cannot accomplish high levels of learning without the culture of the school functioning collaboratively. Hord (1997) labeled this type of interdependence focused on teaching and learning as shared personal practice. Sharing personal classroom practices with other teachers allows for a review of behaviors that help foster or create a community of learners.

6. Academic Success for All Students with Systems of Prevention and Intervention

Success for students is the goal for schools, but how does a school achieve the goal that all students can learn? In their studies of high performing high schools, Cooper and associates (2005) found that when schools had an open principal and aligned curriculum, the school focused on student success and shared the credit when success was found. In schools serving at risk students, Buxton (2005) showed how one school was able to form new identities of institutional culture collectively that ensured success for students. Buxton claimed that focusing on student success was not enough. He proposed that educators in these schools focus on students who were not learning and then address the reasons these students were not learning so that measures could be taken to prevent the failure (Blankstein, 2004; DuFour, 2004). DuFour and associates (2008) concentrated on the need for educators to provide systematic interventions for student who were at risk for failure. These experts stated that teachers that were functioning in collaborative teams with common assessments and pacing would be more effective in their interventions than teachers who do not. If educators want to ensure achievement for all students, they must have a strategy that is uniform throughout the school that encompasses all types of learners and a plan to help those that need extra help (Blankstein, 2004).

7. Professional Development that is Teacher Driven and Embedded in Daily Work

In creating a quality teaching force, many policy makers began to focus on teacher preparation and retention. Historical policies had used professional development as a means of mediating and maintaining quality (Cohen-Vogel, 2005). Many of the professional development events were “one-shot” workshops and failed to provide knowledge and skills to teachers over the life of their careers (Darling-Hammond, 2005). Moreover, teachers did not develop sufficient knowledge and skills from these workshops to solve the problems they will surely encounter

when they attempt to implement newly learned practices into their classroom instruction (Bredesen, 2003). Thus when they encountered these problems and had no one to help solve them, many teachers retreated to their tried, and true practices. Darling-Hammond reported what other countries such as Japan and Germany did to provide increased time and pay to help teachers constantly refine their practice with other teachers. These reforms have proven successful for many of those countries. However in the U.S., Elmore (2006) described educational reforms "post-Nation-at-Risk period,…was largely done to, rather than done with educational professionals" (p. 215). Darling-Hammond, Bullmaster, and Cobb (1996) claimed that in professional development schools or other restructuring schools, they "can offer organic forms of professional leadership that develop intrinsically in connection with systemic organizational change within a school" (p. 103). They also claimed that teacher leadership was essentially connected with teacher learning. Bredeson (2003) described professional development in PLCs by stating,

> In contrast to more traditional work settings where professional improvement is individual and oftentimes completely unconnected to the learning and work of others, in professional learning cultures educators share knowledge through dialogue, consultation, reflective processes, and joint work. These processes help to reinforce explicit values around learning, strengthen individual and collective understanding of practice, and contribute to organizational improvement. (p. 24)

Smylie (1996) also found that the greatest learning opportunities for principals and teachers are embedded in their daily work and are linked to the priorities and context of the school's improvement efforts. Additional educational theorists (Glickman, 2002; Lambert, 2003; Roberts & Pruitt, 2003; Sparks, 2005; Zmuda, Kuklis, & Line, 2004) remarked that leadership by

teachers within schools focused on reform efforts and professional development opportunities can influence the school for change.

Teachers collaborating in instructional teams to improve student learning provides a rich context for job-embedded professional development (Bredeson, 2003; Smylie, 1996). As they interactively work to identify and solve instructional problems, teachers bring their first-hand experience to bear on finding solutions. This first-hand knowledge is laden with knowledge and skills of practice that may be new to other team members. As they incorporate this shared knowledge into instructional solutions, teacher teams work collectively to adapt that knowledge and new skills to meet the unique learning needs of their students. Through this iterative teaming process, teachers expand their knowledge and develop an ever-widening array of pedagogical skills to meet the learning needs of their students.

8. Principal Leadership that Is Focused on Student Learning

Eilers and Camacho (2007) found that if a principal is proactive in developing a culture of change and focused on student learning, the organization's learning increased. Murphy (2001) recommended a reculturing in the field of educational leadership to focus on "the centrality of teaching, learning, and school improvement within the role of the school administrator" (p. 15). Heck (1992) reaffirmed the importance of the instructional leadership role of the principal in determining student achievement. From observing the characteristics of principals who improved student reading scores, Mackey and associates (2006) found that those who understood their role as instructional leaders had a greater impact on student achievement in reading. O'Donnell and White (2005) indicated from their findings that principal behaviors focused on improving school learning climate were predictors of student achievement. Marks and Printy (2003) discovered that when instructional leadership and transformational leadership were integrated, the influence

on school performance was substantial. In order for a professional community to develop, leaders needed to focus their efforts on problems related to continuous school improvement and classroom practice (Kruse & Louis, 1993). Marzano, Waters, and McNulty (2005) stated, "The research of the last 35 years provides strong guidance on specific leadership behaviors for school administrators and that those behaviors have well-documented effects on student achievement" (p. 7). DuFour and associates (2008) defined the job of a principal in a PLC as someone who creates conditions that help adults in the school continually improve their ability to ensure students gain knowledge and skills that are essential to their success.

9. High-Trust Embedded in School Culture

Trust is considered a critical factor in any school improvement (Tschannen-Moran & Hoy, 2000). Tschannen-Moran and Hoy found that trust facilitates productivity, and when it was not present, it slowed progress. Regarding student learning, they also found that when a student did not feel trust, energy intended for learning was diverted and focused on self-protection. Trust was also essential in the implementation of many school-wide reforms, which required participation by the faculty. When distrust was present in the school culture, the school would not be effective in helping students. Trust was also a critical resource as leaders begin plans for improving student learning (Bryk & Schneider, 2002). Bryk and Schneider found that in schools with high levels of trust, students were three times more likely to improve in math, science, and reading.

Bryk and Schneider (2002) described three types of trust: organic, contractual, and relational. Relational trust was the most fitting in school settings where relationships were built between principal and teacher, teachers and teachers, and teacher and students. Rather than just an exchange of products or knowledge, building relationships was the key factor. Although the

principal had formalized authority over teachers, the principal remained reliant on the teachers' joint efforts to keep the social order of the school and the reputation in the community. Relational trust was also made up of personal regard for others. Personal regard was founded upon interpersonal trust, which deepens as individuals perceived that others cared about them and were willing to extend themselves beyond what their role might formally require in any given situation.

Bryk, Camburn, and Louis (1999) also found that the strongest facilitator of professional communities was social trust among faculties. This type of trust became a resource to support collaboration, dialogue, and shared decision making of a PLC. Another finding presented by Bryk and associates was that a mutual supporting relationship existed between professional communities and social trust. Of the five PLC models presented previously, Kruse and Louis (1993) were the only authors to list trust as an element. They considered trust as necessary in shared decision making and collegiality among the faculty, and an essential condition in building a professional community. While Hord's (1997) model did not explicitly list trust among her elements, she did define her element of supportive conditions using Louis and Kruse's (1995) characteristics of respect and trust.

10. Use of Continuous Assessment to Improve Learning

With NCLB's mandates and requirements, educators are to assess student learning. In his writings about continuous assessment, Stiggins (2004) stated, "High stakes testing without supportive classroom assessment environments harm struggling students" (p. 24). Stiggins referred to teachers in their calling to diagnose student needs and collect continuously student evidence-based on high quality assessment in the classroom. In a review of over 20 studies, Black and Wiliam (1998) found that innovations of formative assessments produced substantial

and significant learning gains in students from the age of five to university level students. Formative assessment occurs when teachers adapt their teaching to meet the needs of their students from the results of assessments (Black & Wiliam, 1998). Continuous assessment created a collective focus on student learning, which is central to professional communities by helping faculty guide their instruction to facilitate opportunities for student learning (Louis & Marks, 1998) and to refine their skills for effective teaching. DuFour, DuFour, and Eaker (2008) wrote about continuous improvement as an "ongoing cycle of planning, doing, checking, and acting to improve results constantly…gathering current levels of student learning…and applying the new knowledge in the next cycle of continuous improvement" (p. 465). In Blankstein's (2004) list of elements, he combined both data-based decision making and continuous assessment, alluding to the direct relationship between assessment and using assessment data to improve student learning.

Analysis of the Professional Learning Community Literature Review

Looking at past educational reform movements and modern legislative acts, educators are now in an opportunistic situation to focus on change that works. The pressures of *Nation at Risk* and NCLB, despite their invasiveness or promotion of hysteria, highlighted a need for schools to implement successful lasting reforms that improve all students learning. School leaders will first need to understand the culture, past beliefs, and how people currently work together in the school. After understanding what type of culture the school has, the school leaders can then determine where they want to go. Using successful reforms such as PLCs may be a method for successfully implementing reforms that do work and are helping all students learn. Nevertheless, to facilitate the untapped potential of PLCs, there needs to be a unification of models in how PLC characteristics function together. This unification can then provide a foundation for

measuring PLCs within schools and facilitating future steps in helping schools continue with that goal. Filling this gap in the research could provide critical information for schools and leaders as they begin to construct PLCs within their schools.

Synthesis of the Professional Learning Community Elements

Currently, if educators in a school wanted to determine if a PLC is present in that school, these educators would first have to ask to which author of PLC elements the school adheres. Many authors and researchers have attempted to define and list elements of a PLC. Although many elements are distinct to a particular author, there are some similarities among elements. For example, Hord (1997), Kruse and associates (1995), Blankstein (2004), and DuFour (1998) included collaboration as an element of PLCs. Kruse and Louis (1993) provided the element of trust, which is not addressed by any of the other authors.

When attempting to measure the presence of a PLC in a school based on which elements of a PLC exist or not, educators in the school first need to be establish which model that the school leaders are attempting to follow. For example, Wells and Feun (2007) studied collaborative teams throughout a year after they had received training provided by DuFour and associates (2006). However, when attempting to measure whether the schools had successfully implemented any elements, Wells and Feun used a survey developed by Hord (1997). Hord's elements were different from DuFour's elements, thus posing a problem in the analysis of the results. The researchers attempted to measure a PLC in a school that does not adhere to Hord's elements of a PLC and drew conclusions that the school had not yet implemented a PLC. According to Hord's instrument and defining elements, the educators in the school probably had not implemented a PLC, but perhaps, according to DuFour's model, they had. This lack of common elements has presented difficulties for schools attempting to measure and implement

strategies for improvement with the PLC concepts when there is no consensus on its defining elements.

Creation of Common Elements of Professional Learning Community Literature

As part of the research team of Williams, Matthews, Stewart and Hilton (2007), we conducted an extensive review of PLC literature and determined a universal list of PLC elements. We identified ten elements based on PLC research and practice. The ten elements encompass previous definitions and elements in the literature.

In order to determine a comprehensive list of the five authors and their elements, we identified which elements had common characteristics. The matrix in Table 1 illustrates the authors' elements in comparison to the ten elements. The five authors had listed in some form that common mission, vision, values, and goals were essential in PLCs. Two elements had agreement by four of the five authors, interdependent culture and teaming that is collaborative. The four areas of high trust embedded in a school culture, academic success for students with systems of prevention and intervention, professional development that is teacher driven, and use of continuous assessment to improve learning were similar among three of the authors. The remaining two areas of principal leadership focused on student learning and data-based decision making were only common between two authors. In the creation of the ten elements, we did not include two elements of PLC that Kruse and Louis, and Blankstein had provided. Kruse and Louis's element of school size was an important element of school success, but, as a physical setting, we felt it did not adhere to other instructional issues of PLCs. Similarly, Blankstein's element of gaining academic engagement of family and community, we also determined to be outside the area of instructional issues related to student learning.

Having a common list of elements that encompasses the prominent authors of PLCs will provide a base in which schools implementing any of the five models of PLCs can determine levels the school may be operating within those elements. The list of ten elements that the research team established provided the basis for the creation of an instrument that will measure PLCs in schools. The creation and validation of this instrument will be addressed in the following chapter. In this literature review, we have presented the importance of validity and reliability of an instrument. We have also framed where the PLC reform has arisen and the constituent elements found in the literature. Utilizing the findings from the literature review in building the LCCI, we will now present the plan that was taken in the validation of this instrument.

Table 1. *Matrix of PLC Authors and their Identified Elements*

Williams, Matthews, & Stewart (2007)	Senge (1990)	Kruse & Louis (1993)	Hord (1997)	DuFour & Eaker (1998)	Blankstein (2004)
Common mission, vision, values, and goals	Shared vision	Socialization of new professional members/ shared sense of purpose	Shared values and vision	Shared mission, vision, and value. focus on learning (DuFour, et al., 2006)	Common mission, vision, values, and goals
Principal leadership that is focused on student learning		Principal leadership			
Participative leadership focused on student learning		Facilitative leadership (Louis & Marks, 1998)	Supportive shared leadership		Building sustainable leadership capacity
High trust embedded in school culture	Mental models	Trust	Supportive conditions (relationships)		
Interdependent culture	System thinking	Deprivatized practice	Shared personal practice	Collaborative culture with focus on learning for all	
Academic success for students with systems of prevention and intervention			Supportive conditions (physical structures)	Results orientation	Ensuring achievement for all students with systems of prevention intervention
Professional development that is teacher driven	Personal mastery	Socialization of new professional members		Collective inquiry into best practice and current reality	
Data-based decision making				Action orientation and experimentation	Using data to guide decision making Continuous improvement
Teaming that is collaborative	Team learning	Collaborative shared work Reflective dialogue	Collective creativity/learning (Huffman & Hipp, 2003)		Collaborative teaming focused on student learning
Use of continuous assessment to improve learning		Normative control/ collective focus on student learning (Louis & Marks, 1998)		Commitment to continuous improvement	Using data to guide decision making Continuous improvement (repeat)

Note. Does not include Louis & Kruse, 1993 “School size” and Blankstein, 2004 “Gain academic engagement from family and community”

CHAPTER 3

METHODS

In this study, professional learning communities have ten constituent elements or characteristics developed by the research team of Williams, Matthews, Stewart, and Hilton, (2007). The ten elements provided unity in identifying the elements of a PLC. As described in chapter 2, the ten elements were identified in the literature and provided the foundation to the LCCI. The purpose in creating the LCCI was to measure the degree to which schools were implementing these elements. The focus of this study was to determine the validity and reliability of the LCCI's ability to measure both the ten individual elements of a PLC and an overall level of PLC.

This chapter will begin with a review of the research problem and the research questions. Following the research questions, we present the development and structure of the LCCI. We also describe the four phase iterative process that was followed for validating the LCCI. The chapter concludes with a summary of the methods.

Research Framework

Although many types of school reforms have emerged hoping to improve student achievement, many reforms also failed (Elmore, 1996; Fullan & Hargreaves, 1996; Leithwood, et al., 2002). Some researchers and writers (DuFour & Eaker, 1998; Hord, 1997; Louis & Marks, 1998) have regarded PLCs as a reform that can promote the improvement for student learning. Although there was little evidence that PLCs as a cohesive reform have improved student learning (Wells & Feun, 2007), researchers have demonstrated that specific PLC elements have influenced student achievement. As PLCs have received recent attention and application in

educational practice and literature, the need to have a unified understanding of constituent elements also emerged.

In this study, we provide a new conceptualization of PLCs. As reported in the review of the literature, there was a need to unify the elements of PLCs. There was also a need to develop and validate an instrument to measure PLCs. The ten elements identified in this study provide a unified model of PLCs, and it was upon these ten that the LCCI was created. Having a validated instrument to measure PLC elements will provide school leaders with critical information for implementing PLC reform efforts and could help researchers determine which elements are foundational and vital to the success of the PLCs. The measurement tool will provide specific information of which elements exist in a school and at what degree the school is functioning within the elements. This information should give school leaders direction in how to improve implementation and on which elements to focus.

The LCCI will provide a method of assessing the influence of PLCs on student achievement and show which elements have the greatest influence on improving student achievement. This understanding will help principals and teachers to focus efforts on what provides the greatest influence in helping students.

This instrument will also provide a means for researchers to empirically build the theoretical framework of PLCs. Having a tool to study PLCs will help to provide understanding in how PLCs function and what is their influence.

Questions Guiding the Research

The two problems this study addressed are first, lack of consensus among PLC experts and their defining elements that make up a PLC, and second, the deficit of a validated instrument

to measure PLC elements that schools have implemented. The following three research questions guided this research.

1. Does the LCCI measure unique individual elements of PLCs?
2. Does the LCCI measure an overall level of PLC?
3. Is the LCCI a valid and reliable measure of PLCs?

Development and Validation of the Structure of the LCCI

Validating an instrument is an iterative process that gathers information through measurement processes and systematic diagnosis of the instrument. The information gained from these processes was incorporated into the subsequent versions of the instrument. Throughout the development of the LCCI, there was a purposeful focus on creating a valid instrument. In the instrument development, the research team focused on content validity through the determination of the indicators and the writing of the survey items. As a team, we gave significant effort to capture the elements of PLCs as identified from the literature and expert opinion and to measure accurately the implementation level within a school.

The research team decided to design a quantitative survey based on two considerations. First, we anticipated that this instrument would be administered to hundreds of principals and thousands of teachers. Thus, we needed an efficient way to collect, organize, and analyze the vast amount of data. Second, we planned to use this instrument in large-scale research anticipating that the results could be generalized to the larger population. The research team designed the LCCI survey items by focusing on one PLC element at a time.

Development of Survey Items

Based on the identified elements and expert knowledge of PLCs, we brainstormed possible indicators that would signal the presence of each element in a PLC school culture. For

example, under the element of *Interdependent Culture*, we developed indicators that would show this element was present in a school. For example, in high-functioning PLCs, educators would do the following:

- Collaborate at large;
- Collaborate across disciplines, grade levels, departments, schools, districts;
- Collaborate informally to enhance instructional expertise;
- Share responsibility for all children interdependently;
- Assist spontaneously to help teachers solve problems that improve instructional practice;
- Dialogue continuously to synergize thinking and share and enlarge world views
- Share and expand tacit knowledge;
- Work comfortably inside and outside each others' physical, intellectual, and emotional space;
- Share expert practice continuously among members of the community of practice to spread and create new knowledge of the practice.

These literature based PLC elements and indicators laid the foundation for the development of the LCCI items. With the level of detail they provided, we crafted the survey items. After identifying the indicators for each element, we then decided how to measure those indicators.

The research team developed three types of items to ascertain the level at which schools had implemented the ten elements of a PLC. The decision of what type of response scale to use depended on the kind of information each survey item required. For example, the following item required a frequency response: *How often does your department or grade level instructional team meet to collaborate on improving teaching and learning?* This next example required a

percentage response: *What percent of your instructional goals are derived from multiple sources of data?* The following item required response indicating the degree of agreement*: I help make school-wide decisions that relate to teaching and learning.*

In order to measure the three different types of survey items, we used three types of response scales. Initially a 6-point Likert scale that consisted of "Strongly Agree" to "Strongly Disagree" was selected. No middle or neutral value was provided. Although in some questions, a "Does Not Apply" was provided.

The second type of response scale was a percentage scale used to measure the percent of the time a teacher or team would be involved in the activity identified. The initial break down of percentages was in increments of 25% (i.e., 0%, 25%, 50%, 75%, 100%).

The third type of response scale was a binary scale that was used to determine the presence or absence of an attribute using a yes and no response. These types of items asked such things as whether teachers were placed on a team or whether the school had a written mission statement.

The point of view from which a survey item is written is an important consideration. The research team considered writing items from the third person point of view of how individuals viewed the school as a whole such as, *Faculty members are comfortable seeking advice from one another on instructional problems*. However, this item could also be written from a first-person point-of-view of how individuals personally experienced the culture, for example: *I feel comfortable seeking advice from colleagues to solve instructional problems.* We concluded that writing the items as statements from the first person perspective would give us a more accurate reading of the whole school. A statement from the first person perspective provided what each individual teacher perceived. Thus, collecting all teachers perspectives, we could then compile a

school perspective rather than asking what the teacher's perception was of all members of the school.

To narrow the selection of items and refine the items that would be used in the LCCI, the research team analyzed each item with the following guidelines:

- Was the item clear, specific, and readable?
- Did the item lead the respondents to answer in a certain way?
- Did the item address only one indicator?
- Did the item actually measure the selected indicator for the target PLC element?

Using these guidelines, we refined the items to assess more precisely the specific indicator. To make our final choice of questions and address issues of content validity, we asked a PLC expert who was not affiliated with the research team to cross check our work. This expert analyzed our preliminary list of questions through the same guidelines and offered suggestions for further refinement. From this evaluation, we selected the final LCCI items and prepared for the formal validation process. The final structure of the LCCI included 65 items with approximately six to seven items per element.

At this point in the development of the LCCI, the research team had focused on the content validity internally by purposively selecting and refining items and externally by having an outside expert analyze the items. In order to conduct a more formalized process of determining the face, content, construct, and concurrent validity, we went through three phases. Because the validation process was cyclical, information gleaned from each phase informed and guided the next phase. The purpose in identifying these phases was to provide a structure for reporting corresponding results for each phase. In the following three phases, we will present the processes that provided results to inform the next revision to the LCCI, the types of validity

focused on, and within each phase the specific criteria that we defined as acceptable levels in validating the instrument.

In phase 1, we conducted cognitive interviews and written critiques. Within this phase, we addressed elements of content and face validity. In phase 2, a pilot study was conducted. Within this phase, we presented how content and construct validity were addressed through factor analysis and estimates of reliability of the instrument. Phase 2 also addressed concurrent validity of the instrument by evaluating two measurements of PLCs through the piloting of the instrument. Depending upon what was learned in the first two phases, the information provided guidance and rationale for conducting a third phase of the development and validation of LCCI.

Phase 1: Cognitive Interviews and Written Critiques

In order to refine the structure and items selected in the LCCI and address issues of face validity, the research team conducted cognitive interviews. Cognitive interviews are a technique used in developing survey questions through verbal interviews of individuals reading the questionnaire (Willis, Royston, & Bercini, 1991).

We conducted cognitive interviews with eight K-12 teachers, half of whom were from schools whose principals had participated in the BYU Principals Academy and half of whom whose principals had not participated. The cognitive interviews were taped and conducted with individual teachers using the following procedures. Teachers read and answered each item while one of the researchers noted the time it took to read and answer the question and the other researcher asked the teacher his or her understanding of the question. Questions that the participant found confusing or unclear were flagged to be rewritten. Teachers also offered suggestions for refining the questions. This process was repeated for all questions in the LCCI making the cognitive interviews last an average of two hours. Results from the interviews

provided suggestions for refining semantics and structural organization of the questions. The feedback from the participants helped to gauge whether the items appeared to measure PLC implementation, thus addressing the area of face validity.

Next, we solicited written critiques of the LCCI to 19 K-12 teachers; half of these teachers had principals who had participated in the BYU Principals Academy and half of these teachers with principals who had not participated. The teachers were provided a paper version of the LCCI that included areas for respondents to write comments and critiques of each survey item. To help guide the participants' reflection, three statements were provided to the participant in the comment boxes: the question does not address the attribute, the question needs to be reworded, and the question could be eliminated. The teachers took the LCCI, provided written critiques of each test item, and reflected in writing on their overall feelings about the instrument. The written observations and critiques provided documented suggestions for improving the survey while addressing the area of face validity.

Phase 2: Pilot Study

In order to formally analyze the content and construct validity of the LCCI as we had refined it based on phase 1, we conducted a pilot study. Within the pilot study, I analyzed the results using factor analysis and reliability measures. The data from these processes provided information to help assess the structure and content of LCCI. In order to determine the concurrent validity of the LCCI, specific schools were selected to participate in the pilot study based on an expert assessment of the level of development of PLC at the school.

School Selection

The research team selected the pilot group from possible schools with principals who have attended or were currently attending the BYU Principals Academy. We randomly selected

15 schools using a random number generator after stratifying for three different levels of PLC implementation. The directors of the BYU Principals Academy are experts in PLCs and have a combined 20 years of experience in researching, writing, and teaching about PLCs. The directors determined the school's level of PLC implementation as either an emerging, medium, or high level of PLC development. Their decisions were based on the directors' involvement with each school, its principal, and the schools' length of time involved with PLC.

Missingness Rates

The pilot of the LCCI was administered at each of the fifteen schools. The surveys were given in a paper format to each teacher during a school faculty meeting. So as not to influence responses on questions related to principal leadership, the principal and assistant principals were asked to leave the room while teachers were given the survey. An incentive was given to those teachers who chose to take the survey. The rates of missingness were calculated for all fifteen schools. The criteria established in meeting issues of validity would be a low missingness rate. The definition we determined in meeting the missingness rate criteria, and taking into consideration that the first survey allowed for branching, item skipping, and selections of "not applicable," was 40%. We calculated the rate of missingness by dividing the number of partially completed surveys by the total number of surveys submitted.

Structural Analysis

The process to address issues of content and construct validity was the analysis of the structure of the LCCI. The analysis included three areas: Exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and estimates of reliability (internal consistency) among the survey items. Using two procedures, EFA and CFA, we determined benchmark levels of validity among the conceptual constructs in the survey and tested the conceptual model upon which the

LCCI was designed. The EFA was used as a precursor to the CFA allowing the exploration of the structure of the measurement before confirming the structure. CFA was chosen because it provided a method to confirm the conceptual model upon which the LCCI instrument was designed. Based on the conceptual model that each of the constructs of the LCCI measure unique elements within the school, we determined the EFA and CFA would test that each observed variable loads uniquely onto a latent variable or construct of a PLC solely (see Figure 1).

Exploratory factor analysis. The EFA was conducted by first evaluating each element's loadings and Eigenvalues. Principal Component Analysis (PCA) and Eigenvalues were calculated using the statistical program SPSS. Observing how each element performed in the component analysis, helped to inform the model to be tested in the CFA and provide understanding with the results of the models. We then evaluated the overall structure of the LCCI using a maximum likelihood analysis and rotational method. The criteria we determined that needed to be met within the first pilot study analysis began with the conducting of the EFA. The first criterion within the EFA was that ten unique factors (also referred to as elements in this study) would emerge from the analysis indicated by the item loadings on single factors.

The second criterion would be that all items of the survey loaded onto one overall factor. Definitions in meeting these criteria would be acceptable when we observed loadings that were extracted using a PCA greater than .400 for individual elements. In loading all items onto one overall factor, we considered an acceptable loading to be greater than .300. Pattern matrixes were created using Maximum Likelihood extraction methods. Any factors with multiple item loadings greater than .400 onto two or more factors were not considered acceptable.

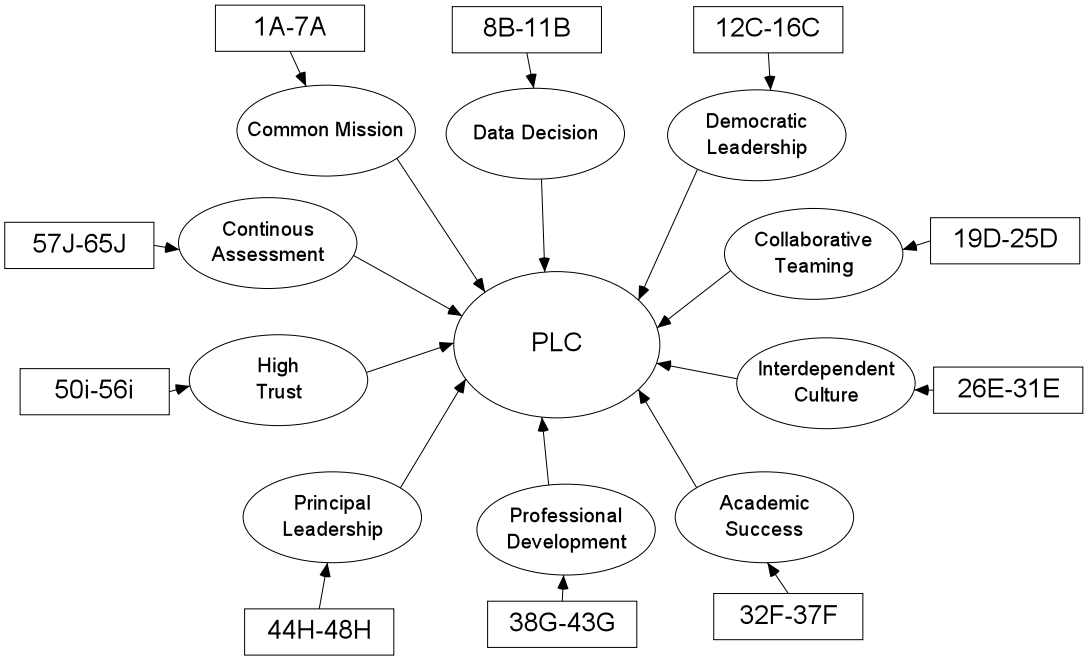

Figure 1. Conceptual model of the LCCI

Another definition in meeting the criteria within the EFA was the number of factors that had Eigenvalues greater than 1.0. If more than one factor had Eigenvalues greater than 1.0, there might be evidence of items loading onto multiple factors. We defined an acceptable Eigenvalue measure as the presence of only one factor with an Eigenvalue greater than 1.0.

Confirmatory factor analysis. The CFA was conducted using the SPSS SEM software program AMOS. We began by building individual models for each element and comparing the fit indices. Using the EFA as a prelude to the CFA guided the building of models and the interpretation of results that we observed. After building individual models, we then built a first order model comparing all elements together. A second order model and bifactor model were built to test the larger structure of the LCCI.

The criterion we determined, which needed to be met within the models we tested in the CFA, was that the models represented a good fit of the data. The CFA tested the models that we had created based upon the results from the EFA. Measures of fit were calculated for three different models. The first model was a first order model testing the hypothesis that each item loads uniquely onto the factor (or element). The second model, which was a second order model, tested the hypothesis that each factor loads onto an overall factor of PLC. The third model tested both models simultaneously in a bifactor model. The levels of acceptance in meeting the criteria were measured from three fit indices: the Normed Fit Index (NFI), Tucker Louis Index (TLI), and Comparative Fit Index (CFI). The Root Mean Square Error of Approximation (RMSEA) was also calculated to determine the estimates of error among the models. The definitions that we determined as good measures of fit were values greater than .80. Any value less than .05 for RMSEA was also considered good. Another measure of fit is X_2, although it is inflated by sample

size and often used for other purposes such as nested models. X_2 is reported in this study, but other fit indices are more reliable (Brown, 2006).

Reliability. We were able to measure the internal consistency of each survey elements' corresponding items using Cronbach's alpha. The evaluation provided a measure of reliability among the items in capturing consistency among each element's items. The criteria needed in meeting issues related to reliability were to have high levels of internal consistency among the survey items. Internal consistency was measured using Cronbach's alpha. A good measure of reliability would be a value close to 1.0 with 1.0 being perfect internal consistency among the items and 0 having no level of internal consistency. The definition of good reliability that we utilized in this study was values greater than .80. Cronbach's alpha was calculated for both the overall survey and each element. Cronbach's alpha was calculated using the statistical software program SPSS.

Concurrent Validity

Concurrent validity was assessed by comparing the average LCCI responses for the three levels of schools identified by the directors. The results were analyzed using an Analysis of Variance (ANOVA) procedure of the different PLC levels that were identified by the directors of the Principals Academy. The ANOVA procedure used was a General Linear Model (GLM), which provided information as to whether the three levels identified by the directors were significantly different from each other. The GLM provided a means of comparing random and fixed factors by nesting the school within the level of PLC as identified by the directors. The definition determined in meeting concurrent validity criterion was that results of each level would significantly differ from one another and that the means of each previously identified level

of PLC would differ correspondingly by level. For example, a high PLC would have a higher mean than a middle level PLC. A GLM was conducted using Minitab software.

Phase 3: Revision of the LCCI, Second Pilot, and Second Analysis

In the final phase of this study, the research team reviewed the results of the first pilot study. Using the same iterative process as described previously, we began again to refine the LCCI further. Based on what we had learned from the first pilot, we conducted revisions to the LCCI survey. Revisions to structure, administration, and questions were informed by utilizing the results of the first pilot. After the revisions were complete, we administered the survey as a second pilot study to two school districts—one large suburban school district that has implemented PLCs for the past four years and a small rural district that had recently begun implementing PLCs. As in the first pilot, analyses of the results were conducted to confirm the changes to the LCCI.

As cognitive interviews and written critiques provided revisions to the survey and the pilot study tested the structure of the LCCI in phase 2, phase 3 provided revisions to the survey based on the first pilot results. To determine which items needed to be revised, removed, or transferred to different elements, we used evidence from the EFA, CFA, and reliability estimates. The EFA provided information on which items did not load onto their intended constructs (the individual elements and overall construct). The EFA also showed which items that were initially thought to be within one element and had loaded onto a different element. We verified all the results observed in the EFA by re-reading the survey text to compare semantics and item structure to see if the items by their wording could adhere to different elements. The CFA also confirmed the results of the EFA by showing which elements had better measures of fit in the models we proposed and which elements had items loading to other elements or not loading onto

any element. Reliability estimates revealed which items if deleted would increase the reliability of the element. From these measures, we were able to make recommendations to revising the wording or structure of the LCCI. The second version of the LCCI survey was then given to outside experts of PLCs to provide additional suggestions or revisions to the survey instrument. These revisions provided a new version of the LCCI that we administered as a second pilot study. The second pilot study's criteria definitions were the same as in the first pilot study.

Summary

In this chapter, we presented the LCCI and its need to be validated so it can provide a measurement tool for PLCs. Assessing whether elements of a PLC exist and to which degree they exist will provide schools with a foundation of results to continue efforts or change current practices within their cultures. An essential dimension presented in this chapter addressed the method for meeting the validity and reliability needs of a survey instrument. Validity was a focus from the beginning of the design of the instrument and was the focus of its piloting and validation phases. The conceptual model of the LCCI was tested utilizing EFA and CFA analysis methods. The next chapter will present the results from the testing of the LCCI.

CHAPTER 4

RESULTS

An iterative process of developing and validating the LCCI was described in chapter 3. Although issues of validity were considered throughout the creation and refinement of the LCCI, three phases provided a formalized process in determining the refinement and validity of the instrument. This chapter will present details from the three corresponding phases and how these results informed and guided the subsequent phases. Specifically, results from the cognitive interviews and written critiques conducted before the piloting of the instrument are presented and followed by the results from the first and second pilot study. The final phase presents the revisions to the instrument that were based on the first pilot study analysis and the results from a second pilot study.

Phase 1: Cognitive Interviews and Written Critiques

Before the piloting of the LCCI, eight teachers were selected to participate in cognitive interviews from five schools with principals who had attended or were currently attending the BYU Principals Academy. We conducted the cognitive interviews to record the thought process of the individual as he or she read through and answered the questions.

We also selected 18 teachers from a different group of five schools with principals who were participating or had participated in the BYU Principals Academy. These teachers were asked to provide written critiques of the LCCI. The teachers were provided a paper version of the LCCI that included areas to write comments and critiques of each survey item.

From the results of the cognitive interviews and written critiques, many respondents recommended semantic and grammatical changes to the texts of the items. Although these recommended changes were considered by the research team, not all suggestions were utilized in

the revision of the LCCI. Some suggestions by the participants were indicative of misunderstanding of PLC concepts. Other suggestions were contradictory to feedback already provided by participants. An example of a suggested change is found in item 3A. Before the cognitive interviews, it read, “Our school mission statement is revisited to make it responsive to the needs of our students.” The suggested revision from the interviewees and critiques recommended changing the word “revisited” to “reviewed.” Because of wordiness, the interviewees also recommended simplifying the statement for the same item. The item was rewritten to read, “Our school mission statement is reviewed at least yearly.” Although ten items received changes in the wording based on the feedback, interviewees had no suggestions for new items and no recommendations that any items be removed.

Based on suggestions from the cognitive interviews and written critiques, changes were made to item response scales. Many of the respondents agreed that the items fit with the intended constructs. Many respondents, however, suggested Likert scale revisions to allow for more choice and clarity in answering. Many participants felt that there was not enough of an option in selecting a response with the 6-point Likert scale. More options in selecting a response were recommended by the participants. Thus, we created an 11-point scale. The scale was also adjusted to include numerical values with each level of agreement. The change provided value with each option and greater ease in coding.

Response values for the percentage questions were also expanded to include a continuum of 100% to 0% on a line with intervals of 10. The changes to the scales were intended to give greater clarity for the respondent in selecting a response.

Likert Scale before Revision

[agree strongly] [agree] [agree somewhat] [disagree somewhat] [disagree] [disagree strongly]

Likert Scale After Revision

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4		3		2		1		0		

Percentage Values Before Revision

[100-85%] [84-70%] [69-55%] [54-40%] [39-25%] [24-10%] [10-0%]

Percentage Values After Revision

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Figure 2. Response scale revisions: before and after revisions.

Table 2. *Pilot Study Results by School, Reponses Received, Rate of Missingness, and PLC level*

School #	Responses Received	Total Number of Teachers	Complete Responses	Partial Reponses	Rate of Missingness	PLC Level
1	65	70	20	45	0.69	High
2	31	35	17	14	0.45	High
3	38	45	16	22	0.58	Medium
4	31	36	13	18	0.58	High
5	44	50	10	34	0.77	Emerging
6	28	30	10	18	0.64	Emerging
7	64	70	11	53	0.83	Medium
8	27	32	6	21	0.78	Emerging
9	21	25	7	14	0.67	Medium
10	40	45	12	28	0.70	High
11	36	43	15	21	0.58	High
12	31	35	8	23	0.74	Medium
13	16	25	4	12	0.75	Emerging
14	30	40	6	24	0.80	Emerging
15	36	38	6	30	0.83	Medium
Total	538	619	161	377	0.70	

The changes we made to the LCCI based on the suggestions from the cognitive interviews and written critiques helped to revise the survey and address issues of face validity. The pilot study was conducted after incorporating the suggested revisions (see Appendix A for version 1 of the LCCI).

Phase 2: The Results from the Pilot Study

The pilot version of the LCCI was administered to teachers from fifteen schools during faculty meetings. We administered the survey in paper format to each teacher in attendance. Teachers were asked not to discuss results while taking the survey. An incentive was given to those who attended and took the survey.

The number of complete responses from piloting the LCCI was lower than anticipated. The total number of complete responses received in the pilot was 161 out of 538. This provided a missingness rate of 70%. To account for this missingness in the design of the LCCI, we had created branching within the items to allow for those who had no perspective on an item to skip to subsequent sections. An example of branching can be found in the first version of the survey in element A that began with item 1A asking the teacher whether the school had a mission or vision statement. If the respondent selected no, he or she was directed to skip the next seven questions because these asked the teacher how the school utilized the mission statement.

Branching also occurred in item 24D that asked if the teacher's team had established group norms. If the teacher selected no, he or she was told to skip the next item that asked if the team followed the group norms. The high rate of missing responses was because of the design of the LCCI. Elements A and item 24D had a combined missingness of 56%. However, the remaining 14% missingness was a result of using a paper survey that allowed respondents to leave items blank. The 70% missingness rate did not meet the definitions that we had previously

Table 3. *Identifying Elements and Descriptors*

LCCI Section	Descriptor	Element
A	Mission	Common mission, vision, values, and goals that are focused on teaching and learning
B	Decision	Decision making based on data
C	Participative	Participative leadership that is focused on teaching and learning
D	Teaming	Teaming that is collaborative
E	Interdependent	Interdependent culture
F	Academic	Academic success for all students with systems of prevention and intervention
G	Development	Professional development that is teacher driven and embedded in daily work
H	Principal	Principal leadership that is focused on student learning
I	Trust	High-trust embedded in school culture
J	Assessment	Use of continuous assessment to improve learning

produced estimates of the reliability or internal consistency of the items of the LCCI. Four items (1A, 17D, 18D, and 24D) were excluded from these analyses because they were categorical responses.

Table 3 provides the abbreviated descriptions to represent the corresponding elements that were analyzed in this study. The ten elements are identified by a letter and a corresponding descriptor.

First Pilot Study Analysis Results

The results from the analysis of the pilot study data will be presented according to the two research questions related to the structural validity of the LCCI. The first research question was *Does the LCCI uniquely measure individual elements of PLCs?* The second question was *Does the LCCI measure an overall level of PLC?* In this section, we will present the corresponding EFA and CFA results with each research question.

Research Question 1: Does the LCCI Measure Unique Individual Elements of PLCs?

The EFA and CFA provided results in order to test the theory that the LCCI measures individual elements of PLCs. These two processes indicated whether the individual elements were loading separately.

Exploratory factor analysis. The EFA was conducted to explore the results of the pilot study and to compare the theory based on the LCCI conceptual model. In conducting an EFA, two indicators of successful factor loadings were monitored (see Table 4). The first indicator was loadings from a PCA that were greater than .400. The second indicator was having one Eigenvalue greater than 1.0. In conducting a PCA for each element that we observed, all but one element, *Development*, loaded uniquely onto its corresponding factor. *Development* loaded onto two different factors. The first factor had loadings greater than .669 and the second factor had

loadings less than .387. We also observed that all elements, excluding *Development* and *Assessment*, had Eigenvalues that were greater than 1.0 for single factors. *Development* and *Assessment* had two Eigenvalues greater than 1.0. The percentage of variance explained for each individual element was greater than 47% (for complete EFA results for first pilot study, see Appendix C).

These EFA results provided evidence that the LCCI was measuring individual elements of a PLC, excluding *Development* and *Assessment*. These two elements appeared to be measuring two separate constructs within each element.

Confirmatory factor analysis. In order to confirm the results of the EFA and examine the fit of the factor structure of the conceptual model, several single first order models were built. For an example of a single model, see Figure 3. The first theory of the conceptual model needed to be confirmed in the CFA. As supported by strong loadings and single Eigenvalues of each element, there was evidence that each element, excluding *Development* and *Assessment*, was uniquely measuring a single construct.

To begin the CFA, we built models for each respective element to confirm that individually the items loaded onto their intended constructs. The measures of fit for each model are presented in table 5. Two fit indices revealed a good measure of fit of the data for all elements in supporting the model with NFI greater than .812 and CFI greater than .822. However, the TLI fit index revealed five elements less than .776. RMSEA values for all elements, excluding *Decision*, were greater than .09. Although two indices provided evidence of good fitting models, the TLI and RMSEA showed that some models of elements are problematic.

Table 4. *Eigenvalues and Factor Loading from the First Pilot Study*

Element	Descriptor	Eigenvalues >1	First Loading	Second Loading
A	Mission	3.381	6 items >.662	
B	Decision	2.259	4 items > .693	
C	Participative	3.401	5 items > .734	
D	Teaming	2.622	6 items > .581	
E	Interdependent	3.154	6 items > .666	
F	Academic	2.834	5 items > .664 1 items > .354	
G	Development	3.023 1.059	6 items > .610	6 items >.302
H	Principal	4.534	6 items > .869	
I	Trust	4.365	7 items > .684	
J	Assessment	4.167 1.279	9 items > .494	3 item >.340

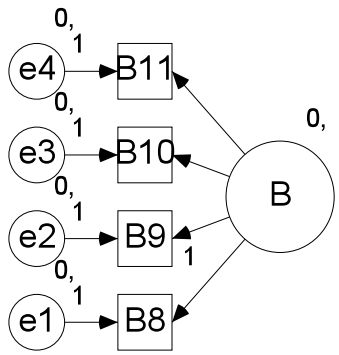

Figure 3. An example of a single element first order model. Element B: Decision.

Table 5. *First Pilot Model Results: Individual Models*

Model	DF	NFI	TLI	CFI	RMSEA	X^2
A	9	0.955	0.913	0.963	0.09	48.4
B	2	0.922	0.986	0.997	0.03	03.0
C	5	0.892	0.682	0.894	0.25	168.90
D	9	0.882	0.752	0.894	0.11	67.1
E	9	0.910	0.807	0.917	0.13	90.8
F	9	0.850	0.667	0.857	0.15	121.80
G	9	0.897	0.776	0.904	0.14	106.40
H	9	0.980	0.960	0.983	0.09	51.1
I	14	0.944	0.899	0.95	0.12	118.20
J	27	0.812	0.704	0.822	0.15	335.30

This evidence posed a dilemma in deciding measure we should accept as evidence supporting the structure of the LCCI. We tested the second theory of the conceptual model after confirming that the models of each element were supporting the evidence from the EFA and that each item loaded onto its respective factor with a moderate to good level of fit.

Research Question 2: Does the LCCI measure an overall level of PLC?

To test the second theory of the conceptual model, we conducted an EFA to explore the structure of the LCCI in its ability to measure an overall level of PLC. We also conducted a CFA to confirm the theory that we were testing. The same two indicators of Eigenvalues greater than 1.0 and loadings greater than .400 were monitored to determine if the items were measuring an overall factor of PLC.

Exploratory factor analysis. The number of Eigenvalues greater than 1.0 observed in the EFA was 14 with the first value at 20.177. The cumulative percent of variation explained by the 14 values was 74%. The Eigenvalues indicated that 14 factors were emerging from the items of the LCCI. This was partially observed in the first question, when *Development* and *Assessment* had two factor loadings. However, two additional factors emerged when loading all items together.

In loading all questions onto one overall factor, all but two items (21D, 34F) had loadings greater than .400. Item 34F was problematic in the first EFA. When individually looking at the element of *Academic*, it loaded with a .354. Item 21D also had a lower loading in the first EFA than did the remaining items of *Teaming* with a loading of .581. Nevertheless, all other items loaded at an acceptable level onto one overall factor of PLC.

Confirmatory factor analysis. To confirm in the CFA what we had observed in the EFA that all items successfully loaded onto a single overall construct, we began to build larger

models. The first model built was a first order hierarchal model. This oblique model tested that each item loaded onto the item's corresponding factor and correlated with all other elements. The results (see Table 6) produced NFI, TLI, and CFI indices of less than .804, however, this model had an RMSEA value of .06. In building a second order model, which tested that each item loaded onto the corresponding factor and then each factor loaded onto an overall construct of PLC, the results revealed fit indices less than .785 and similar RMSEA (see Table 6).

The second order hierarchal model tested the theory that in succession the questions loaded first onto individual constructs and then onto one overall construct. However, the EFA provided evidence that the factors individually and combined had acceptable loadings. A bifactor model provided an alternative approach to the analysis. The bifactor model provided an adaptation to the hypothesis that the factors and items would simultaneously load rather than in succession. A bifactor model was the final model that we tested in the CFA (see Figure 4). In comparison to the second order hierarchal model that we built initially, the results provided a slightly better fit with the bifactor model than the second order hierarchal model. Although the result of the bifactor model was a moderate level of fit (NFI=.768, RMSEA=.054).

A review of the results from both the first and second questions provided evidence of some elements having a better fit individually and together than did other elements. An additional EFA and CFA were conducted to isolate which elements were performing better. A rotational method revealed the separation of elements into two groups based on their success in loading uniquely onto single constructs. Using the rotational extraction method Promax with Kaiser Normalization, we were able to separate more finitely the ten elements into two groups of elements. The first group, *Mission, Decision, Teaming, Principal*, and *Trust*, loaded with

Table 6. *First Pilot Results: Results from the Group Models*

Model	DF	NFI	TLI	CFI	RMSEA	X^2
1st order All	1724	0.733	0.785	0.804	0.06	5045.2
2nd order All	1642	0.717	0.769	0.785	0.064	5244.7
Bi-factor All (Fig. 4)	1596	0.768	0.821	0.839	0.056	4305.7

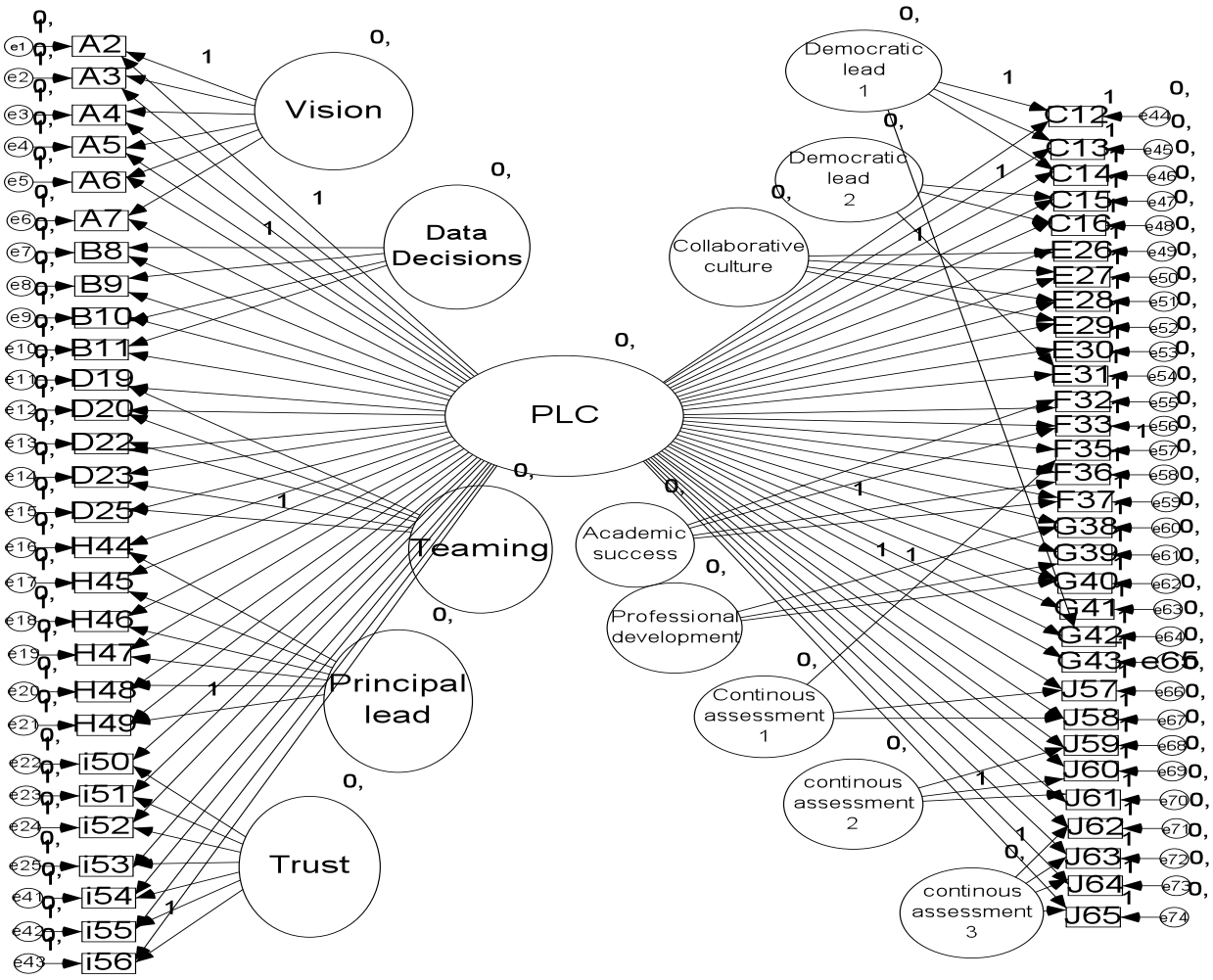

Figure 4. Bifactor model with all groups

correlations greater than .500 individually onto corresponding constructs. The second group, *Participative, Interdependent, Academic, Development*, and *Assessment* were problematic because they loaded onto multiple factors with loadings less than .500. *Participative* had loadings greater than .400 onto two factors and *Assessment* had loadings greater than .419 onto three different factors. *Academic* also had some items loading onto a second factor. Within the second group of elements, three items (31E, 35F, 42G) loaded strongly onto factors outside of their anticipated elements.

In order to test in a CFA the two different groups that formed within an EFA, a first order model for each respective group (ABDHI and CEFGJ) was built. The CFA confirmed that the model of ABDHI constructs fit better together than the CEFGJ model (ABDHI: NFI=.901, RMSEA=.046; CEFGJ: NFI= .798, RMSEA=.076) (see table 7). In order to test to see if each group would load onto an overall factor, second order hierarchal models produced a good fit with group ABDHI (NFI=.891, RMSEA=.05) and a moderate fit with group CEFGJ (NFI= .749, RMSEA=.085). Previously, by building bifactor models to test the simultaneous loading of both factors, we also built bifactor models for both groups (see Figures 5 and 6), which yielded an improved fit of the models.

Table 7. *Model Results for Groups*

Model	DF	NFI	TLI	CFI	RMSEA	X^2
1st order ABDHI	340	0.901	0.983	0.944	0.046	731.4
2nd order ABDHI	345	0.891	0.922	0.934	0.050	813.2
1st order CEFGJ	408	0.798	0.802	0.838	0.076	1667.9
2nd order CEFGJ	428	0.749	0.754	0.788	0.085	2074.1
Bi-factor (Fig. 5) ABDHI	322	0.908	0.935	0.949	0.046	685.5
Bi-factor (Fig. 6) CEFGJ	405	0.831	0.844	0.873	0.067	1391.1

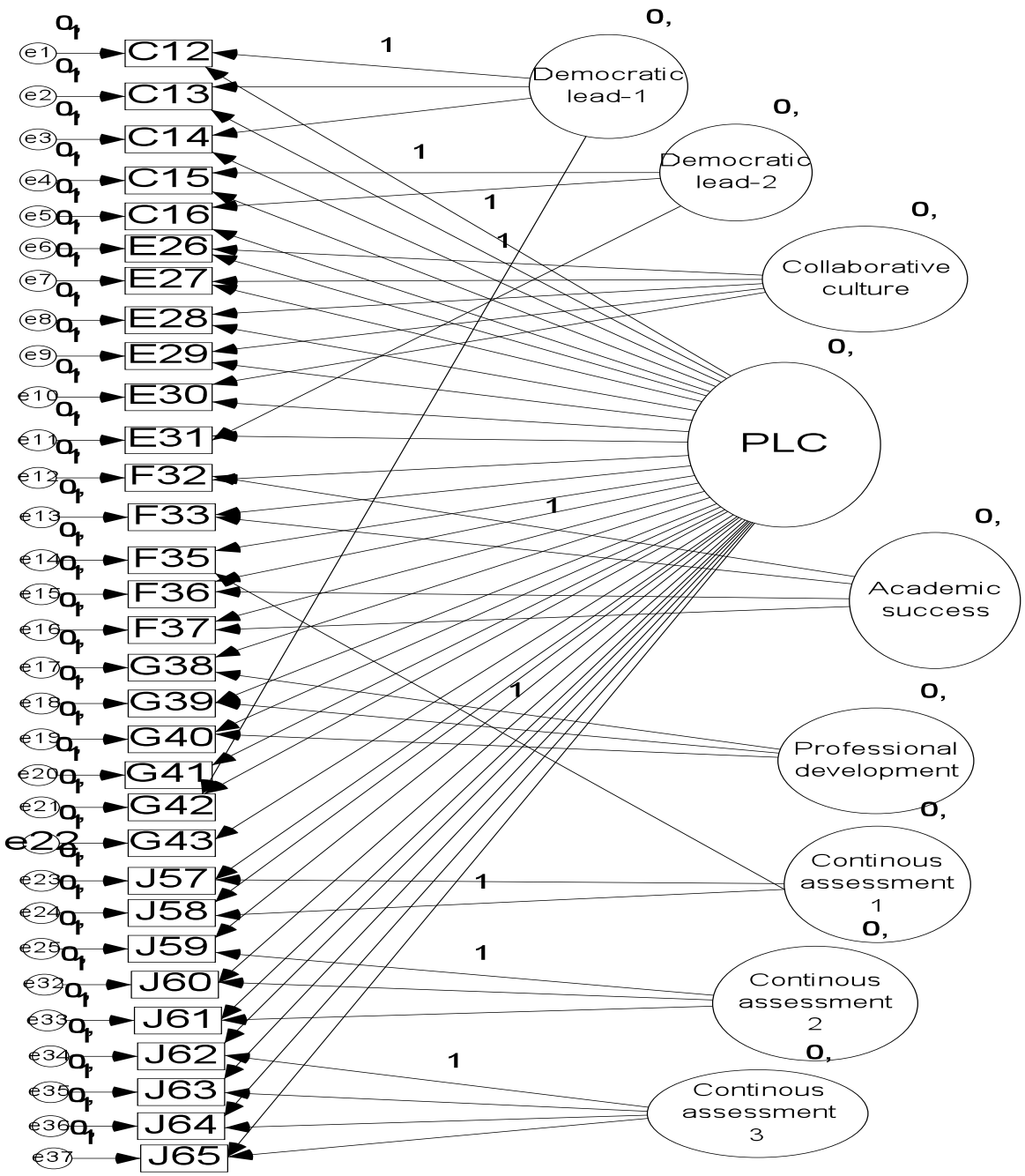

Figure 5. Bifactor CEFGJ

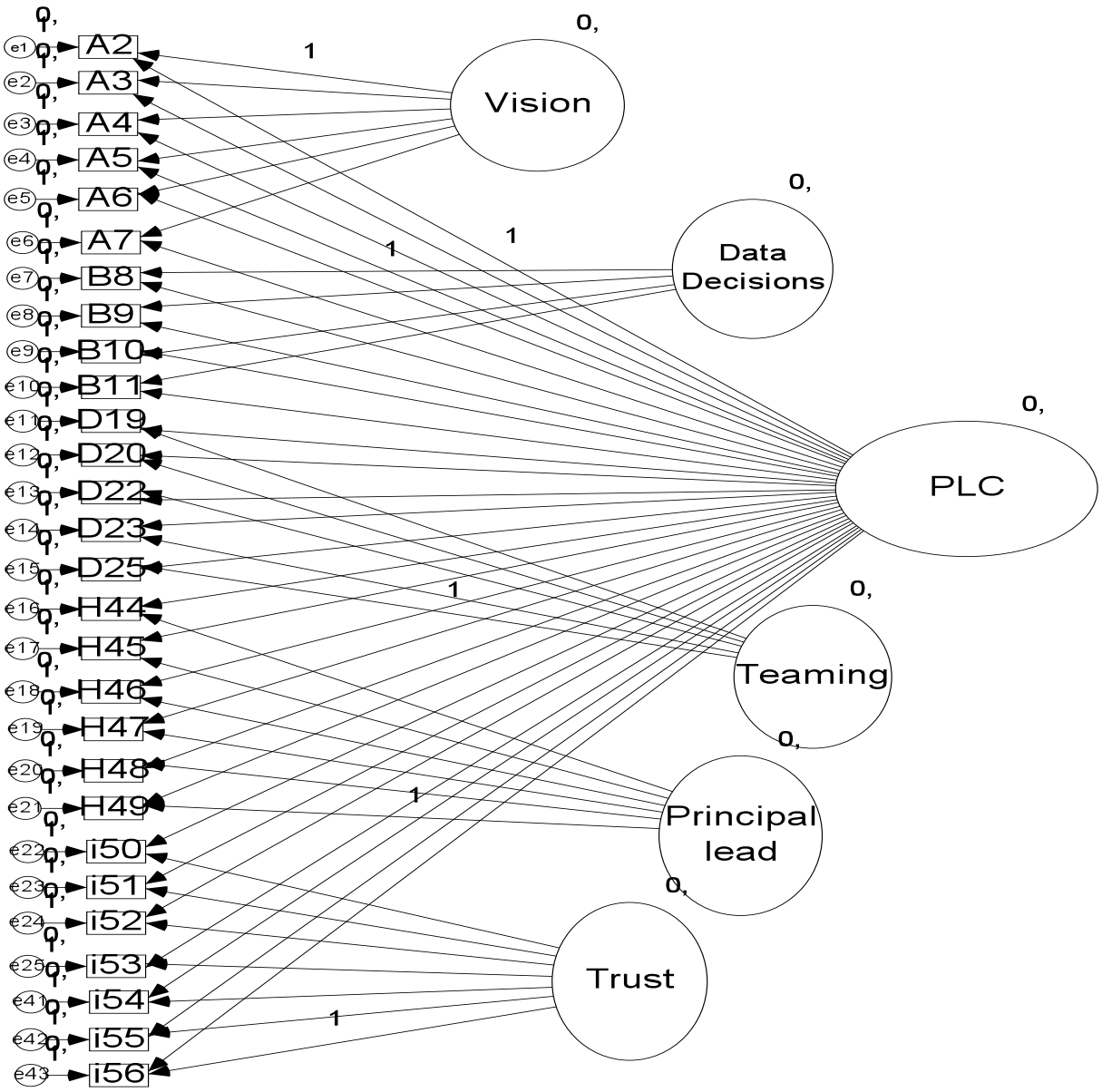

Figure 6. Bifactor ABDHI

First Pilot Study Reliability Results

In order to determine the LCCI's reliability, Cronbach's alpha was used to measure the internal consistency. The LCCI had an overall acceptable level of reliability of .959. Six of the ten elements, *Mission, Participative, Interdependent, Principal, Trust,* and *Assessment*, produced reliability estimates greater than .80 (see Appendix C for first pilot study reliability results). The remaining four elements, *Decisions, Teaming, Academic*, and *Development*, had values less than .80 but greater than .723. The output within SPSS *Cronbach's Alpha if Item Deleted* results revealed that only one item, 34F, if deleted would increase the elements respective alpha coefficient.

Concurrent Validity Results

Concurrent validity of the LCCI was explored by comparing the data from the pilot study to an expert designation of the schools' development level of a PLC. The schools in the pilot study were selected based upon their level of PLC development as determined by expert review. Specifically, five schools were selected in each of the following categories: emergent PLC, moderate PLC, and high PLC. If the expert review was accurate and if the LCCI measured the level of PLC in a school, then we expected the average scores from the LCCI to be different across the three levels of development determined by expert review.

Results from the exploratory and confirmatory factor analyses of the pilot study data revealed that only 5 of the 10 LCCI elements were internally consistent and valid. The average of these five elements (*Mission, Decision, Teaming, Principal,* and *Trust*) was used to explore the concurrent validity of the LCCI.

As predicted by expert review, the emergent PLC schools' group average was lowest (M=7.23, SD=1.17); the high PLC schools group average was highest (*M*=7.88, *SD*= 1.09); and

the moderate PLC schools group average was between them (M=7.43, SD=1.18). A general linear model was used to test whether these group means were significantly different from each other. The response variable was the teacher average on the five elements. The PLC development variable was the primary explanatory variable, and a school variable was included to account for the potential dependency among teacher scores from the same school. Results from the analysis are found in Table 9. These results indicate that the PLC development means are not statistically different from one another at a significance level of 0.05 (p=0.157).

Concurrent validity was not clearly established for these data. While the relative size of the group averages were correctly predicted by expert review, these group means were not statistically significant at the standard level of 0.05. One possible explanation for this is that the expert review misclassified some of the schools, that is, some of the schools may have been at PLC development level different from what the experts observed.

Another possible explanation that concurrent validity was not clearly established is that the sample size of the pilot study was not large enough to clearly detect differences between the groups. While there are several hundred teachers who provided data for the pilot study, there were only 15 schools included in the pilot study, and the number of schools is the effective sample size for testing differences between groups of schools. A p-value of 0.157 is moderately small and suggested there might be a difference in LCCI scores between these groups. A significant difference might be detectable in other studies if more schools are sampled.

Another explanation for the inconclusive concurrent validity is worth consideration. It is possible that schools that are emerging as professional learning communities might overestimate their level of development out of ignorance of what professional learning communities truly are.

Table 8. *Mean Scores of Each School by PLC Level, Overall, and Element*

PLC Level	PLC Level M	sd	School #	Overall Mean	Mean A	Mean B	Mean D	Mean H	Mean I
Emerging			5	7.21	7.5	6.6	5.8	7.7	8.0
Emerging			6	7.69	7.6	7.5	6.9	8.9	7.5
Emerging			8	7.05	5.9	7.0	6.2	8.0	7.7
Emerging			13	7.84	8.1	7.2	6.2	9.0	8.3
Emerging	7.23	1.17	14	6.74	6.7	6.3	5.0	7.6	7.3
Medium			3	7.83	7.6	6.2	7.9	8.5	8.2
Medium			7	6.72	6.8	5.7	7.4	6.5	6.8
Medium			9	8.33	6.7	7.7	8.5	9.4	8.8
Medium			12	7.27	7.9	7.0	5.5	8.7	7.1
Medium	7.43	1.18	15	7.83	6.9	7.9	7.8	8.4	7.8
High			1	7.64	7.6	6.4	7.7	8.0	8.0
High			2	8.46	7.9	7.6	8.8	9.5	8.2
High			4	7.74	7.4	7.3	7.8	8.0	7.9
High			10	7.76	6.8	6.4	8.0	8.7	8.2
High	7.88	1.09	11	8.12	8.6	6.9	7.6	8.4	8.5

Table 9. *Results of General Linear Model Analysis Comparing School and Level*

Variable	DF	Seq SS	Adj SS	Adj MS	F	Sig.
Level	2	35.965	30.470	15.2350	2.16	0.157
School (Level)	12	91.038	91.038	7.5865	7.76	0.000
Error	524	512.600	512.6000	0.9783		
Total	538	639.600				

This phenomenon has been observed in various fields of study and has been labeled the J-Curve effect (Erb & Stevenson, 1999) because initially an organization's understanding of a new initiative is shallow, but members of the organization think they are functioning at a higher level than they actually are. Over time as the organization grows in understanding, members will actually drop in their perception as to how they are enacting the initiative. Organizational members will realize that they were not performing according to the demands of the endeavor because they have a deeper understanding of the requirements. Eventually the organization's members will have a higher understanding and an accompanying perception of excelling in the endeavor beyond initial levels. While this J-curve was not observed in the pilot study data at the group level, the possibility exists that the overestimation of performance because of shallow understanding was occurring at various emerging schools in the pilot study.

Phase 3: The Revision of the LCCI, Second Pilot, and Second Analysis

The final phase in the development and validation of the LCCI included the revisions to the first version of the survey, a second piloting of the second version of the LCCI, and a second pilot study analysis from the new administration. In this phase, we will describe how the results from the previous two phases informed the revisions that were made to the LCCI and present a second pilot study of the instrument.

Second Revisions to the LCCI

The revisions to the survey were based on the results of the pilot study and the recommendations by PLC experts. The revisions were conducted by the research team that created the LCCI. Revisions to the survey were divided into two components. The first component contained revisions to the items. The second component contained revisions to the structure and administration of the LCCI.

As a research team, we began revising the questions by looking at the results from the EFA, CFA, and reliability estimates. Within the EFA, we targeted five elements that had problematic loadings. *Participative*, *Interdependent*, *Academic*, *Development*, *Principal*, and *Assessment* had loadings onto multiple factors and loadings less than .400. Some items (31E, 35F, 42G) were loading onto elements outside of their intended constructs. *Participative* had loadings greater than .581 but onto two different factors. *Assessment* had similar strength in loadings as *Participative*, but onto three different factors. Two items (21D, 34F) did not load onto the overall construct of a PLC. Within the CFA, the results highlighting which elements were problematic from EFA were substantiated. The CFA also revealed that elements *Participative*, *Teaming*, *Academic, Development*, and *Assessment* had fit indices less than .900 and RMSEA values greater than .11. From these results, we determined that elements *Participative, Teaming, Interdependent, Academic, Development, Principal*, and *Assessment* needed revisions. As indicated in Table 9, the number of revisions and additions from the first version to the second version was greatest among those identified elements. However, we revised the remaining four elements based on recommendations from PLC experts. We also included negatively worded questions.

To begin the changes to the elements, we started by eliminating items that were problematic in the validation. Fourteen total items were removed from the first version of the LCCI. Seventy percent of the removed items came from the six elements that we had determined as problematic. Item 34F was eliminated based on the results from the EFA and reliability estimates. The other four items were eliminated based on changes to the structure of the survey and changes in the response scales of the survey.

As an alternative to eliminating more items from the survey, we determined to revise existing items. Eighteen of the original 65 items we revised to read differently. Some revisions were minor such as 19D that had originally stated, “My department or grade level instructional team sets goals and objectives that guide our efforts to improve teaching and learning” to the revised item that stated “My instructional team sets goals and objectives that guide our efforts to improve teaching and learning.” This revision was simply the change from “department or grade level instructional team” to “instructional team.” Other revisions were major changes such as 21D that originally stated, “I have received professional training on collaboration” to a more specific statement of “I have participated in professional development to learn various skills of collaborating to improve student learning.”

In review of the pilot study results, we determined that the branching structure of the instrument facilitated the problem of high missingness rates. Based on the high missingness rate, we decided to eliminate all branching from the survey. All categorical questions, except item 18D, were eliminated. Item 18D was considered an essential categorical question that asked of how often the teacher’s instructional team met.

An additional change we made to prevent the high missingness rates was changing the method of administration of the LCCI. In the pilot study, we had used a paper format in which responses could be left blank. We changed the process of administering the LCCI to a digital online survey that was completed by teachers on a computer. We elected to use the online survey website Qualtrics. The online version could be e-mailed to the teachers’ computers and completed either in a designated window of time or at the convenience of teacher. The online survey required each response to be completed before moving on within the survey. Qualtrics website also allows the administrators to track completion results of all participants. The online

version of the survey also decreased the processing time of the results. Rather than coding the paper responses to an electric format, the results data could be downloaded from the website.

An additional benefit to the online version of the survey was the randomization of the survey items. Rather than organized into the constituent elements as in the pilot study, the online version provided randomization of all items each time the survey was taken.

In the first version of the LCCI, there were ten percentage scaled items. In the administration of the first pilot study, we received feedback from multiple participants that the percentage scales were problematic and confusing. We revised three of the ten percentage scale questions to become Likert scale responses. Three other percentage scale questions were eliminated from the survey, thus retaining only four percentage scaled responses in the second version of the LCCI (see table 10).

Another change made to the LCCI was the inclusion of negatively worded questions. Survey methodologists include the alternation of positive and negatively worded questions to reduce response sets or agreement bias in the respondents (Yamaguchi, 1997). Five existing items were revised to become negatively worded statements and six additional negatively worded items were added to the survey.

A final change we made to the first version of the LCCI was including additional items to the survey. Twenty-eight new items were added to the second version of the LCCI. Twenty-five of the 28 (90%) new items were in elements we identified as problematic. Six of the 28 were new negatively worded question. Two of the added questions came from separating a single item into two items. The three items in elements that were not identified as problematic were added to replace items that had been eliminated from the element. The addition of items was based on the results of the validation and recommendations by the PLC experts. The recommendations by the

Table 10. *LCCI Revisions*

Element	LCCI 1 item #	LCCI 2 item #	Change in item #	Items removed	Items added	Items revised	Items changed to negative wording	Negative items added
A	7	6	-1	2	1	2	1	0
B	4	4	0	1	1	0	0	0
C*	5	7	2	1	3	3	1	2
D*	9	15	6	2	8	3	0	1
E*	6	8	2	1	3	0	1	0
F*	6	7	1	3	4	3	0	0
G*	6	8	2	2	4	3	0	1
H	6	6	0	1	1	2	0	1
I	7	7	0	0	0	0	2	0
J*	9	11	2	1	3	2	0	1
Total	65	79	14	14	28	18	5	6
Percentage scaled items	10	4	-6					
Categorical scaled items	4	1	-3					
Likert scaled items	51	74	23					

Note. * indicates elements identified from EFA and CFA as problematic.

PLC experts were based on their experience with PLCs and their knowledge of PLC literature and were applicable in addressing issues related to content validity. With the revisions to the second version completed, we then conducted a second administration of the LCCI to revalidate the changes we had made to the LCCI (see version 2 of the LCCI in Appendix D).

Second Pilot Study Analysis of the Second Version of the LCCI

The second pilot study analysis of the LCCI followed the same organization as the first described in phase two. In meeting the assumptions required in conducting this analysis, the sample size was adequate at 1467. The second assumption of multivariate normality was similar to the first pilot in that the second administration results indicated that the data was approximately normal with most skew and kurtosis levels at +/- 2.0 (Schumacker & Lomax, 2004). The last assumption of handling missing data was also met. In the second administration, we had acceptable levels of missingness rates, and only complete data were used in the analysis.

The second pilot study analysis involved three processes. The first was the exploratory factor analysis that reviewed the results of the survey and explored the structure of the survey items according to the two theories that the LCCI measures individual elements of a PLC and measures an overall PLC. The EFA provided an additional test of the theories of this research by exploring the results of the data. Confirmatory factor analysis was the second process used to confirm the testing of the two theories. The final process of the first pilot study produced estimates of the reliability or internal consistency of the items of the LCCI. One item was excluded from the statistical analysis. Item 21D was excluded because it asked for a categorical response of how often the teacher's team met.

In the previous pilot study, before the processing of any results, we needed to resolve the problem of missing data. Fortunately, because of the number of complete responses, no

imputation was utilized in the second analysis. The results analyzed were only complete responses from the two districts (N=1467). In analyzing the results in this step, we used the statistical software SPSS.

Second Pilot Study Analysis Results

The results from the analysis of the second pilot study data will be presented according to the two research questions related to the structural validity of the LCCI. The first research question is *Does the LCCI measure unique individual elements of PLCs?* The second question is *Does the LCCI measure an overall level of PLC?* In this section, we will present the corresponding EFA and CFA results with each research question.

Research Question 1: Does the LCCI Measure Unique Individual Elements of PLCs?

The EFA and CFA provided a test of the theory that the LCCI measures individual elements of PLCs. These two processes indicated whether the individual elements were loading separately.

Exploratory factor analysis. The EFA was conducted to explore the results of the pilot study and compare the theory based on the conceptual model of the LCCI. In conducting an EFA, two indicators of successful factor loadings were monitored. (see table 11) After performing a PCA within the EFA, four elements, Teaming, Academic, Development, and Assessment, loaded onto two different factors. The factor loadings within each element had loadings greater than .481, excluding Teaming that had two items with loadings less than .405. Mission, Decision, Participative, Interdependent, Principal, and Trust had Eigenvalues that were greater than 1.0 for single factors. Teaming, Academic, Development and Assessment had two factors greater than 1.0. The percentage of variance explained for each individual element was greater than 44%.

Table 11. Eigenvalues and Factor Loadings for Second Pilot Study

Element	Descriptor	Eigenvalues >1	First Loading	Second Loading
A	Mission	3.438	6 items > .482	
B	Decision	2.308	4 items > .719	
C	Participative	3.786	7 items > .556	
D	Teaming	6.986 1.076	14 items >.341	4 items > .307
E	Interdependent	3.831	8 items > .516	
F	Academic	4.007 1.001	7 items > .681	5 items > .349
G	Development	3.508 1.173	8 items > .587	5 items > .378
H	Principal	4.058	6 items > .786	
I	Trust	3.309	7 items > .561	
J	Assessment	5.738 1.164	11 items >.406	4 items > .312

The results from the EFA revealed evidence that many of the elements are loading onto individual factors. However, four elements were problematic in that they were loading onto two factors and have two Eigenvalues greater than 1.

Confirmatory factor analysis. In order to confirm the results of the EFA and examine the fit of the factor structure of the conceptual model, several single first order models were built. The strong loadings and single Eigenvalues of each element provided the evidence that each element, excluding Teaming, Academic, Development, and Assessment, were uniquely measuring a single construct.

To begin the CFA, we built models for each respective element to confirm that individually the items loaded onto their intended factors. The measures of fit for each model are presented in table 12. The fit indices for all elements revealed a good measure of fit of the data in supporting the model. All elements had NFI fit indices greater than .932 and TLI greater than .907. This was a stronger result than we had observed in the first pilot study. The RMSEA values also improved from the first pilot study, four elements had values greater than .097. Although Teaming, Academic, Development, and Assessment had multiple loadings in the EFA, the models confirmed that individually the models were a good fit of the data.

After confirming that the models of each element were supporting the evidence from the EFA and that each item loaded onto to its respective factor with a good level of fit, we then began to test the second theory of the conceptual model.

Research Question 2: Does the LCCI measure an overall level of PLC?

To test the second theory of the conceptual model, we conducted an EFA to explore the structure of the LCCI in its ability to measure an overall level of PLC. We also conducted a

Table 12. *Second Pilot Results: Individual Models and Fit Indices*

Element	df	NFI	TLI	CFI	RMSEA	Chi-Sq
A	9	0.989	0.986	0.992	0.048	39.50
B	2	0.994	0.987	0.996	0.044	7.6
C	13	0.972	0.959	0.975	0.075	119.200
D	75	0.956	0.955	0.963	0.061	490.600
E	18	0.973	0.965	0.977	0.057	104.900
F	11	0.947	0.903	0.949	0.130	281.900
G	18	0.932	0.903	0.937	0.088	224.200
H	7	0.962	0.921	0.963	0.138	202.800
I	13	0.939	0.907	0.943	0.094	182.100
J	41	0.964	0.958	0.969	0.067	307.500

CFA. The same two indicators of Eigenvalues greater than 1 and loadings greater than .400 were monitored to determine if the items were measuring an overall factor of PLC.

Exploratory factor analysis. The number of Eigenvalues greater than 1 observed in this EFA was 13. The first Eigenvalue was 27.103, and cumulative percentage of variance explained by the 13 factors was 62.8%.

In loading all items onto one overall factor, all items loadings were greater than .334. We then created a rotated factor matrix of all factors using the rotational method of Varimax with Kaiser Normalization. Three items failed to load at the threshold of .300 (3A, 38E, 55G). In the matrix, we also observed that many elements had loadings onto multiple factors. Elements such as Mission, which previously within the EFA we had observed single factor loadings and an Eigenvalue of 1.0 for a single factor, were now loading with other elements. Many elements had loadings greater than .400 onto the first factor, while also loading with slightly weaker loadings onto a second factor. However, many of the second loadings were isolated items from the element.

Confirmatory factor analysis. To confirm again in the CFA what we had observed in the EFA that all items loaded onto a single overall construct and to confirm the second theory of the conceptual model, we began to build larger models. The first model built was a first order hierarchal model. This oblique model tested each item loaded onto the item's corresponding factor and correlated items with all other elements. Also in this model, we correlated 14 item errors based on the modification indices observed in each individual elements model. The result (see table 12) produced a moderate fit of the data in confirming the model. It was a substantial improvement from the first pilot study results. (1^{st} pilot NFI = .733, 2^{nd} pilot NFI =.810)

We built a second order model that loaded each item onto the corresponding factor and then each factor loaded onto an overall factor of PLC. The model revealed a moderate to good fit of the data (see table 13). Although this result was an improvement from the first pilot study, the fit was still less than .800 (1st validation NFI=.717, 2nd validation NFI=.781). However, the RMSEA values were at .05 indicating a good fit of the data.

As in the first pilot study analysis, we used a bifactor model to also test the second theory of the conceptual model. The bifactor model provided an adaptation to the theory that the factors and items would simultaneously load rather than load in succession. Another adaptation we made to the bifactor model in the second pilot study was correlating the same errors that we had correlated in the second order model. We allowed five items to load onto other elements (see Figure 7). We identified the five items from the rotated factor matrix based on their strong loadings onto another element and through a re-reading of the item's wording to confirm theoretically that they could align with the different element. The results of the bifactor model provided an acceptable level of fit in representing the data with an NFI of .825 and RMSEA of .052.

From the matrix and based on an additional review of the individual element results, we separated more finitely the ten elements into two groups of elements as in the first pilot study. Before the rotated factor matrix, the first group, Mission, Decisions, Participative, Interdependent, Principal, and Trust loaded onto corresponding constructs with correlations greater than .500. Also before the rotated factor matrix, the second group, Teaming, Academic, Development, and Assessment were problematic because they loaded onto multiple constructs with some loadings less than .400.

Table 13. *Second Pilot Model Results: Higher Order Models*

Model	Df	NFI	TLI	CFI	RMSEA	Chi-Sq
1st order All	2866	0.81	0.835	0.842	0.051	13923.3
2nd order All	2901	0.781	0.807	0.813	0.055	15988.1
Bifactor All	2542	0.825	0.846	0.855	0.052	12433.0

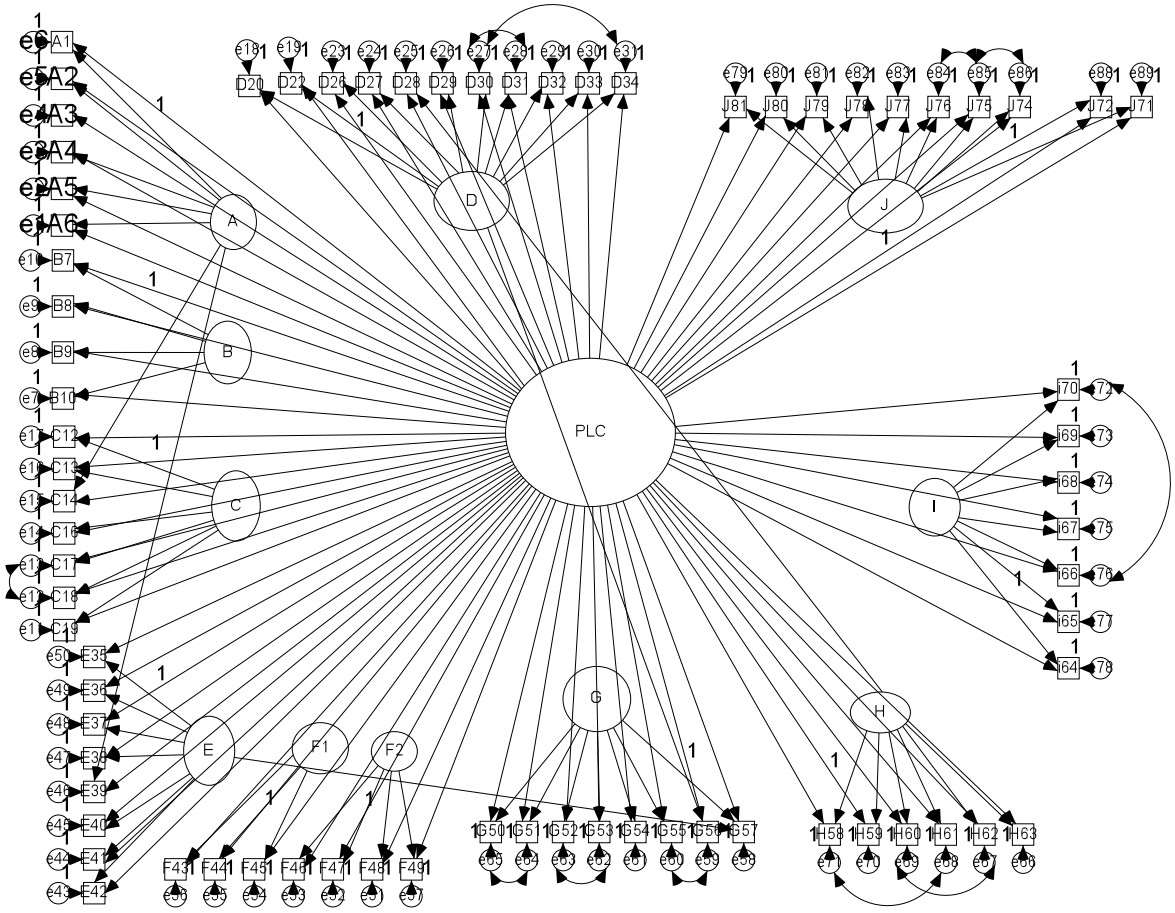

Figure 7. Second pilot study: bifactor model.

Within the results of two groups, two pairs of elements that loaded strongly together were identified, Interdependent and Trust, and Academic and Assessment. These pairs of elements had most of their items loading together with loadings greater than .300. Other isolated items would load strongly onto other elements, such as item 56G loaded with a .590 onto Teaming and item 39E loaded with a .451 onto Mission. Other individual items loaded onto multiple factors, but in providing a theory to test in the CFA, we only considered items that had strong loadings and theoretically from reading the items saw that the content of the item related to the other element.

In order to test the two groups that we had observed in the EFA, we built a first order model for each respective group (ABCEHI and DFGJ). The CFA did not confirm that the two models had different levels of fit. Both models provided equal fit in representing their corresponding data (ABCEHI: NFI=.876, RMSEA=.056; CEFGJ: NFI= .875, RMSEA=.0.059) (See table 14). The best fitting model for the two separate groups was a bifactor model for each group. The fit indices for both groups were near .900 with RMSEA values near .05.

Another model we built to test an additional finding of the EFA that related to the additional findings in the EFA was a single construct model. The model tested that two pairs of elements may actually be attempting to measure the same construct. As we had identified within the EFA, Interdependent and Trust, and elements Academic and Assessment had multiple items loading together. In order to test the additional theory that these two pairs of items might be more unified than we had anticipated, we built a model with all the items of the respective pairs loading together on one factor. We then compared it to a first order model. The single construct model tested the theory that all items within the pairs were attempting to measure the same construct.

Table 14. *Loadings for Second Pilot Group Models*

Model	Df	NFI	TLI	CFI	RMSEA	Chi-Sq
ABCEHI	646	0.876	0.886	0.896	0.056	3619.6
ABCEHI 2nd order	655	0.863	0.874	0.882	0.059	4014.6
ABCEHI Bifactor	623	0.887	0.894	0.907	0.054	3288.7
DFGJ	724	0.875	0.885	0.893	0.059	4420.5
DFGJ 2nd order	726	0.873	0.883	0.891	0.059	4493.1
DFGJ Bifactor	690	0.89	0.895	0.907	0.056	3909.6

The first order model tested each individual element's items attempt to measure a separate construct.

Theoretically, the two pairs of elements were similar in the content they were attempting to measure. The items *Interdependent* and *Trust* were attempting to measure *Interdependent Culture* and *High Trust Embedded in the School Culture*. *Academic* and *Assessment* were attempting to measure *Academic Success for All Students with Systems of Prevention and Intervention* and *Use of Continuous Assessment to Improve Learning*.

In building the single construct model, we eliminated items that had not loaded in the EFA (E and I=items 35E, 36E, and 38E; F and J=items 44F, 45F, and 73J). The results supported the hypothesis that the two pairs were attempting to measure the same construct. The single construct model had a better fit of the data for EI than the first order model had. The single model FJ had a slightly lower fit when compared to the first order model. Although the bifactor models provided the best fit of the data, the bifactor supported the evidence of the single construct model by also testing whether the items were measuring the same construct by loading the items simultaneously with the elements (see Table 15).

Second Pilot Study Reliability Results

In order to determine the second version of LCCI's reliability, we measured the internal consistency using Cronbach's alpha. The LCCI had an overall acceptable level of reliability of .971. After excluding three items (3A, 13C, 21D), we observed that eight of the ten elements produced reliability estimates greater than .80. The remaining four elements had values less than .80 but greater than .752. The *Alpha if items deleted* result revealed that three items, 25D, 27D, and 37E if deleted would increase the alpha coefficient for its respective element. However, the increase would be only minimal.

Table 15. *Single Construct Models*

Model	df	NFI	TLI	CFI	RMSEA	Chi-Square
EI 1st order	88	0.878	0.865	0.887	0.086	1038.90
EI 2nd order	88	0.878	0.865	0.887	0.086	1038.90
EI Bifactor	74	0.904	0.875	0.912	0.083	818.7
EI Single construct	89	0.835	0.815	0.814	0.101	1411.10
EI Single construct (35E, 36E, 38E)*	53	0.890	0.872	0.897	0.093	730.8
FJ 1st Order	128	0.938	0.935	0.945	0.067	962.8
FJ 2nd Order	128	0.938	0.935	0.945	0.067	962.8
FJ Bifactor	111	0.950	0.941	0.957	0.063	765.5
FJ Single construct	129	0.880	0.866	0.887	0.096	1855.30
FJ Single construct (44F, 45F, 73J)*	88	0.892	0.878	0.898	0.101	1412.30

* *indicates excluded items from the model*

Summary of Results

The results presented in this chapter provided a moderate to strong validity and reliability of the items and constructs attempting to measure the implementation levels of PLCs. There were concerns with the multiple loadings of items and elements. Although there might be overlap in the concepts that they are attempting to measure in the element and items, the statistical validation indicated a substantial amount of crossover. The second pilot study provided stronger results in the EFA, CFA, and reliability when compared to the first pilot study results. However based on the results, there are still elements with weaker reliability and multiple cross loadings. In the final chapter, we discuss the findings of this study, future research recommendations, and limitations of this study.

CHAPTER 5

DISCUSSION

Richard DuFour (2007), one of the most prolific writers of PLCs, wrote an article titled, *Professional Learning Communities: A Bandwagon, an Idea Worth Considering, or Our Best Hope For High Levels Of Learning?* In the article, he captured the two most pressing dilemmas of PLCs and essentially verified the purposes for conducting this research. The first dilemma DuFour proposed was that educators were confused about what a PLC was. PLCs have been so quickly defined, described, listed, bought, sold, and tried on as the trendiest effort for schools scrambling to help improve student scores that PLCs might be in jeopardy of losing all meaning. The second dilemma DuFour described was that if educators wanted to determine the influence of a PLC in their school, a way to "determine if PLC practices were actually in place in the school" (DuFour, 2007, p. 4) must be developed. These two dilemmas captured the problems of this study. The two problems as stated previously are the lack of consensus among PLC elements and models and the lack of validated instruments to measure them. Focusing on these two problems, the research team identified ten elements describing a PLC from the literature and then created the LCCI. It then became my purpose for this research as a member of the research team and as an independent researcher to ensure that what we had identified and created was valid and reliable in measuring PLCs so that the LCCI could be used to measure PLCs in schools.

A tool can have many different uses. A tool can help to build something. It can help to measure something. It can also be used to destroy something. How do researchers know if the tool is accurately measuring something? Some tools are so simple in their measurements that the result can only provide a near estimation. Some tools that have been calibrated and well developed can measure with specific exactness. For example, some tools are used to measure in

feet while others are used to measure in inches or even millimeters. As with any tool, it needs to be useful and functional for the intended purpose for which it was created, otherwise it is not worth using. The LCCI is a tool. It was created as a tool for schools. More specifically, it was created as a tool to help educators help students. It was also created to help educators build PLCs, and PLCs are implemented to help students learn at higher levels. The purpose of this study was to determine if the LCCI was accurate and exact in measuring a PLC. The results showed that the LCCI did measure PLC levels within schools. The results also showed that the LCCI was practical and could be used by educators in schools to develop their PLC strategically. In this chapter, we will share why these conclusions can be made.

In order to address the purposes of this research methodically and effectively, we determined specific research questions for deciding on the best plan for determining the validity and reliability of the LCCI. The plan proved to be a solid process in modifying, measuring, and gauging the validity of this instrument. As with any work, there are limitations and recommendations for the next steps, but a more important question to address in this chapter is how will the results of this research help schools and in turn help students?

Problems and Purpose of the Research

We started this study because of the problems that emerged in the literature as our research team worked with principals who were learning and studying the concepts of PLCs. As principals were reaching the second year in implementing PLC strategies, they were looking for a way to see if their efforts in building PLCs were successful. As we considered existing measures of PLCs, we detected a lack of agreement among the prominent PLC elements by experts in the field. We also found that there was a shortage of validated instrument to measure the degree to which critical PLC elements were functioning in implementing schools. In an

attempt to solve these problems, the research team identified ten elements that grew out of our examination and analysis of the authoritative and scholarly literature. We then built a survey that could measure schools against these ten elements and provide a degree to which educators in the schools were implementing the PLC elements. We systematically analyzed and refined the LCCI through an iterative process that was constantly informed by each phase's measures. In order to frame this study, we asked three questions to guide this work.

1. Does the LCCI measure unique individual elements of PLCs?
2. Does the LCCI measure an overall level of PLC?
3. Is the LCCI a valid and reliable measure of PLCs?

These questions framed the research we conducted, and the responses to the questions provided additional evidence in drawing the conclusions that the LCCI was a valid and useful survey tool for educators trying to create PLCs in schools.

Research question 1: Does the LCCI measure unique individual elements of PLCs?

One of the strongest evidences of this research was that the LCCI did measure unique individual elements of a PLC. The strength of this evidence came from the fit indices of the models of the factor analysis from both validations for each individual element. Another strength came from the bifactor model. Conceptually, the bifactor model tested questions 1 and 2 together. The bifactor models showed that the best explanation of the data came when the individual elements were simultaneously measured together with the overall PLC measure. These results gave evidence that the LCCI measured unique individual elements of PLCs.

Research question 2: Does the LCCI measure an overall level of PLCs?

After revising many of the items and elements based on the results of the pilot and first statistical validation, the models showed evidence that the LCCI was measuring an overall level

of PLCs. As in question 1, when we included the bifactor model in the analysis, the measures of fit also improved. This evidence supported the LCCI as measuring an overall construct of PLCs.

Research question 3: Is the LCCI a valid and reliable measure of PLCs?

The four areas of validity addressed in this study are face, content, concurrent, and construct. Multiple sources provided support in providing evidence of face and content validity to the instrument. The first support came from the results of the cognitive interviews and written critiques. Although some respondents suggested revisions to the wording and structure of the LCCI, most respondents found the items readable and applicable to the element they were intended to measure. Respondents in the pilot study also provided similar feedback to the structure and items of the survey. The factor analysis revealed which items needed to be revised, but for the most part, the items provided adequate evidence that they were appropriately worded.

Based on the rate of missingness and factor analysis, the research team changed the LCCI structure and a number of survey items. Another measure that provided support for the face and content validity of the LCCI was the high internal consistency of the elements. We were able to determine reliability of the instrument by measuring the internal consistency of the LCCI. The first and second pilot studies of the LCCI gave similar high levels of internal consistency. These high levels of reliability provided the evidence that the LCCI was a reliable measure. Based on these findings, the evidence was strong that the LCCI had face and content valid.

Concurrent validity was not clearly supported by the results of the ANOVA test in comparing whether each PLC level identified by the directors of the Principals Academy were the same. Although means of each level were different, the results showed that the groups identified by the directors were not statistically different due possibly in part to a misidentification of the level of school and that the schools may be exhibiting the J-curve effect.

Both questions 1 and 2 provided strong support of content and construct validity to the LCCI. Establishing that the LCCI measured individual elements and an overall measure of PLC supported the areas of content and construct validity. The LCCI was a valid and reliable measure of PLCs. Later we will show additional statistical and practical evidence that also supported the LCCI as a valid measure of PLCs. Seeing the strength of these results also supported the overall purpose of this research in developing an instrument that could help educators in their implementation of PLCs in schools. Using these questions as a framework to guide this research has also provided a framework in presenting a summary of the conclusions of this work. In answering the questions, results have shown that the LCCI was a valid measure of the constituent elements and an overall PLC.

Analysis and Results of the Validation Plan

We used three phases in the process of validating the LCCI: cognitive interviews and written critiques, first pilot study, and a second pilot study. The phases also included measures to ascertain the validity and reliability of the LCCI. To determine statistical levels of the validity and reliability, measurements such as descriptive statistics, factor analysis, structural equation modeling, and Cronbach's alpha were used. Within each measurement, we also established levels of acceptable criteria. The process and measurements were specifically designed to address the four areas of validity we had chosen to focus on in this study. In order to reflect and evaluate the process we had chosen, we saw benefits from the types of measurement we had selected. Each measurement provided an essential view for understanding the data and how the data represented the measures of the LCCI. Factor analysis provided testing of the theoretical constructs. Reliability estimates provided testing of the internal consistency of the items. We were satisfied with the plan used to validate the LCCI. Although including other measures such

as test and retest reliability would have provided additional insight into the reliability of the LCCI, the measures selected gave sufficient evidence to answer the questions of this research and concluded that the instrument was valid and reliable and had practical application.

Practical Evidence of Validity

In supporting the conclusions of this study, support for face validity and criterion (concurrent) validity came from the practical evidence. Face validity means that in the text and organization the test appears to measure what the author was trying to measure (Bryant, 2000). However, face validity is not whether the test actually measures the idea. The cognitive interviews, written critiques, and pilot administration of the LCCI provided the evidence of face validity that the items and structure of the LCCI were trying to measure constructs of PLCs.

Criterion, or more specifically concurrent validity, is how well an instrument can replicate another established measure of a known indicator of a concept (Bryant, 2000). It is concurrent in the sense that the two measures of the same idea produce similar results. For example, if a person measures the temperature outside with a digital thermometer or a mercury thermometer, both measurements should give similar readings of the temperature. In the pilot study, we had two measures. The first measure was conducted by the directors of the Principals Academy. The second measure was through the LCCI. By comparing the LCCI results with the levels indicated by the directors, we observed that the results were similar. The results of the pilot study revealed that the LCCI was concurrently measuring levels of PLCs. Measuring the face and concurrent validity provided the practical evidence of the LCCI. It was practical in that it was easy to read and understandable in what it was trying to measure. This survey was also practical in that the survey replicated what outside experts had observed from the studies of

schools. Again, this provided support for the conclusion that the LCCI was practical and could be used in schools to help build PLCs.

Statistical Evidence of Validity

We used statistical means to address the two remaining areas of validity, that is, content and construct. Content validity is whether the instrument measures everything it was supposed to measure about a construct (Bryant, 2000). An example would be if a test were created to measure the types of leader power (French & Raven, 1959), it would include the five areas of power, namely: legitimate, reward, coercive, expert, and referent. If the test measured only some of the types of power and not the others, it might be considered to lack content validity. The LCCI attempted to measure two types of content, namely, individual elements of a PLC and an overall level of PLC. Based on the identified elements from the literature, all ten elements should be measured in the LCCI. In measuring an overall PLC, the ten elements were identified as essential elements of a PLC. Although the theoretical and conceptual model created from the literature and PLC experts provided some measure of content validity, the results of the factor analysis in both validations gave additional evidence of content validity. The results were at or near the criteria that we had established as acceptable.

The final type of validity, often considered the culminating concept of validity (Messick, 1995; Shepard, 1993), was construct validity. Construct validity is whether the measurement actually measures what the instrument was trying to measure (Bryant, 2000). If a test is trying to measure whether an individual is able to drive a car, the test, whether through observing the driver and asking him or her questions about operating a car, should provide a representation of the actual knowledge and skill of the individual driving a car. Construct validity has an internal and external component. The internal component is the internal structure of the measurement.

The external is representation of the model and the relation to constructs outside of the model. The internal structure of the LCCI was heavily supported by results of chapter 4 as represented in the answers to questions 1 and 2. This component was important to consider because it provided the greatest rationale in supporting the first conclusion of this study that the LCCI was a structurally valid instrument. However, the concurrent and face validity evidence gave the only support of external validity. Additional evidence, which will be addressed in the recommendations, was needed to support the LCCI's external validity.

Also within construct validity and pertinent to this type of study, two sub-measures of convergent and divergent validity existed. Convergent validity is the degree to which multiple measures of a similar construct converge or agree (Bryant, 2000). Divergent validity is a measure of whether questions from an instrument attempting to measure different constructs are dissimilar or divergent. Both convergent and divergent validity were assessed in the CFAs and represented in questions 1 and 2. The testing of whether the LCCI measured individual PLC elements or question 1, divergent validity or question 2, or provided an overall PLC measure addressed convergent validity. The greatest evidence in support of these two measures of construct validity was the results from the bifactor models. The bifactor models tested both divergent and convergent validity simultaneously and were the best fitting of any model tested.

The statistical evidence that addressed areas of content and construct validity directly connected to the first conclusion that the LCCI was a valid and reliable instrument that measured the constituent elements and overall level of PLCs. The face and concurrent validity provided support for the second conclusion that the LCCI was practical by providing concurrent measures of PLCs and that it was easy to read and understand what was being measured.

Discussion of Implications

We begin this section by asking the question of "so what?" So what if we know that the LCCI was valid and reliable in measuring the 10 elements that the research team identified in the literature? What were the implications of this knowledge? We determined two implications for this knowledge—practical and theoretical.

Practical Implications of the Study

Educators in schools have been spending money and time to implement PLCs. These educators have made efforts to create instructional teams and to build common assessments and curriculum standards. Some educators in schools did not implement any strategies of PLCs and claimed they were a PLC. Other educators were not sure if they were a PLC but extensively applied PLC strategies. Some educators have studied and implemented the DuFours' (2006) model of PLCs. Other educators have studied and implemented Hord's (1997) model. These educators wanted to know where they were in establishing a PLC. Where can educators focus their next efforts? What are the strengths of the PLC in their schools? Why should they invest time and money in the PLC process without the evidence that it was improving student learning? The knowledge from this study has implications in these areas. The practical implications of this knowledge are that now educators have a means of measuring PLCs despite the model they might follow.

The purpose in creating the LCCI and its contribution to the field of PLCs was to provide administrators and educators with an accurate measure of how schools are functioning as PLCs. One practical use of the LCCI is to diagnose the development of individual elements of PLCs in schools. And similar to the development of individual elements, a second practical use is that the LCCI can diagnosis and develop the overall PLC in schools. A third practical use of the LCCI is

that educators who are considering implementing PLC strategies can use it as a benchmark for measuring levels of development and growth from one point to the next.

The LCCI can be used to diagnosis current implementation levels of PLC elements in schools. The diagnosis can be a single initial look or a continual observation of the school over time. From the diagnosis, the results from the LCCI can provide data so that educators can identify areas in need of improvement on which to focus their efforts. An example might be within the element of teaming. If a school has been creating instructional teams and providing time for these teams to meet, the school leaders might want to know how the teams are functioning. The LCCI provides levels in which the instructional team is functioning in a specific area such as common assessments. These teams may have scored high on administering teacher-made common assessments but scored lower on using the results to differentiate instruction. Based on these findings, the school leader could plan professional development that specifically focused on how teachers could use the results of common assessments to modify instruction that accommodated the needs of students who demonstrated mastery, approached mastery, or who just did not get it. Repeat administrations of the LCCI may provide monitoring as to how the team is improving in the element of teaming.

A second use for the LCCI is a measurement of the overall level of PLCs within a school. District leaders, principals, and teachers can use the LCCI to diagnosis the school-wide level of PLC implementation. Similar to the individual element diagnosis, the overall measure may provide general needs of the school in the elements of a PLC. Recommendations for professional development and goal setting may emerge from the school results.

A third practical use of the LCCI is for educators in schools or districts considering implementing PLCs to use the LCCI as a tool to gauge initial benchmark levels. These

benchmarks provide a baseline from which school leaders can assess their growth on individual elements or PLCs as a whole. It can also provide school faculties that have not begun the study or utilization of PLC strategies with evidence that shows how they may be functioning within individual elements. School leaders could use this information to determine where to focus their PLC implementation efforts.

A fourth practical use of the LCCI is that it provides a detailed model of what PLCs are and how they function by using an instrument that has been substantiated statistically. This model could serve as a vision of what a high functioning PLC would look like. Rather than relying on general PLC descriptors such as collaborative teaming, systems of prevention and intervention, or common assessments, the items under each major element put details to that element. For example, under the element *Academic Success for All Students with Systems of Prevention and Intervention*, six items bring specificity to what those systems look like and how they operate, including identifying students who are not mastering core concepts and systematically providing them with extra instructional time and support to achieve mastery. These items provide educators with a clear picture of what their systems of prevention should look like and how they should function.

The practical uses presented in this section are focused on the day-to-day functions of schools. However, this knowledge is not limited to the practice of schooling. These findings also provide important implications for the theoretical base of PLCs.

Theoretical Implications of the Study

As referenced throughout this study, several models of PLCs existed in the literature and the field. Each model claimed to help improve student learning. Unity and empirical evidence to support the theory of PLCs was needed in order to substantiate PLCs as a successful and lasting

reform that improved student learning. The PLC literature was rich on claims of success but poor on empirical evidence to substantiate the claims (Wells & Feun, 2007). Anecdotal stories of success were positive and provided situational and brief moments of support to the PLC models. However, to build this theory and create a unified framework in which PLCs could be substantiated as "the most promising strategy for sustained, substantive school improvement" (DuFour & Eaker, 1998, p. xi), a valid measurement tool was needed. If researchers begin to study the influence that PLCs had on student achievement, DuFour (2007) acknowledged, "Any valid assessment of the affect of PLC concepts on a school…would first need to determine if PLC practices were actually in place in the school" (p. 4). Up until now, only one PLC model had an instrument--Hord's (1997) model and Huffman and Hipp's (2003) modified Hord's model.

The final theoretical use that we will describe in this section is using the LCCI as a means of conducting further research and empirical studies to contribute to the theory of PLCs. Wells and Feun (2007) stated that the meaning of PLCs are confusing. In their work, they utilized Hord's (1997) instrument to measure whether the schools had successfully implemented DuFour's (1998) model. They also drew attention to the lack of research linking PLCs to improved student learning. Multiple models and lists of constituent elements are rampant in the literature. To provide a foundation to build this research, there is a need for a unified model. The elements of the LCCI provide this reconceptualization of PLCs in which researchers could begin a coherent effort to substantiate this reform strategy. This study comes at time when many authors and researchers have created claims of success with PLCs, but now these claims need to be substantiated as a real solution for school improvement.

Limitations of the Research

Despite trying from the beginning to take methodic and systematic steps to make sure the research team addressed all the areas of validity in this research, some limitations remained. We found three limitations as we evaluated the output of this research.

The first limitation was that external validity of this study was limited from the two administrations of the LCCI to only schools that adhered to a DuFour model of PLCs. The homogeny of the two administrations specifically located only in Utah might not be reflective of schools nationwide. This research did not address schools outside of Utah that might be using different PLC models, but the research team plans to continue the validation in the future.

Another factor limiting the validity of this study was the method of selecting schools to participate in the validation of the LCCI. Schools were selected in the first pilot study through a stratified random sample. However, the second piloting of the LCCI was a purposive selection of two different school districts based on their implementation of PLCs and locations. As identified by Garson (2007), a limitation with non random samples was that a factor analysis was considered only exploratory in nature rather than confirmatory. This study might be considered confirmatory because of the nature of PLCs and their implementation in schools. Educators elect which reform efforts to utilize in their schools, thus only some schools might choose to implement PLC ideas. We rationalized the purposive sample of the second administration because the number of districts utilizing PLCs in all schools was limited. Randomly selecting schools or districts posed a problem in that first, it was difficult to find schools implementing PLCs; second, it was difficult to determine whether they were implementing PLCs; and third, randomly selecting from within a district or state population might identify schools that have no exposure to PLCs. Before the LCCI, no instrument existed to determine if PLCs under a

common conceptualization existed in schools. Finding schools that were implementing PLCs required identification by experts of PLCs. The purposive samples, although introducing potential bias, were beneficial in this type of study and provided support in confirming the structure of the LCCI.

A final limitation of this study was the generalizability of the results of the LCCI from one school to another. The results of the LCCI were unique to each school in that they captured the perception of individuals at that school for the time it was administered. Making inferences about one school and applying those inferences to another school were limited. The results could not be predictive because they were limited to individuals' perceptions, which were dynamic and not reflective of the population. They were also limited because the LCCI measured the level or degree to which a school implemented a PLC element. The PLC level might be different throughout the year and for every school.

Recommendations for Future Research and Uses of the LCCI

In review of the results and conclusions of this study, we have determined three areas that need additional research. Within each area of need, we provide recommendations for addressing the need. The three areas include the PLC models, the LCCI's structure, and the validation of the LCCI. We conclude this section by providing potential uses of the LCCI.

Area 1: PLC Models Recommendation

This study offered a reconceptualization of the model of PLCs by providing 10 identifying elements. This research provided a first step in the confirmation of the new model. This research revealed evidence that the 10 elements the research team found existing in the literature linked to an overall idea or construct. Although some questions continue to exist as to whether certain elements needed to be combined or whether some items in the survey needed to

be included with different elements, broadly these elements showed substantial support in measuring what the research team had deemed to be a PLC. However, linking these elements to improved student learning, which is the expectation of PLCs, has not been substantiated. This model provided a framework in which the elements could be tested and studied to see if each element was essential in a PLC. By having a common list of elements, researchers could study which elements emerged first in a school or were foundational to building a PLC. Based on this area of need, we recommend the following.

In order to test this model of PLC, we recommend that future researchers study the influence of these elements in schools. Some possible outputs as evidence of improvement might be teacher retention, student achievement, at risk student gains, or graduation rates. Another beneficial study would be to determine which elements are foundational in beginning a PLC. Studying longitudinal data from the time a school begins the process of becoming a PLC might provide evidence as to which elements are foundational or essential in the emerging stages of a PLC. Connecting elements to student achievement might also show which elements have the greatest influence on student achievement and thus, might be foundational. Utilizing the existing theory and research on PLCs, this model encompasses the prominent PLC researchers and writers. This model not only provides a tool for measuring PLCs, but it also provides a model that encompasses and extends all other prominent models. Schools will not be limited in choosing which sources of supporting research to study and build their PLCs if they desire to measure and gauge levels of implementation. Rather than adhering to only one author or one researcher such as the DuFour model or Hord model the school faculty may utilize both and be able to measure both implementations. In this recommendation, we anticipate that other

researchers will begin to substantiate the claims of PLCs and connect the lists of elements to improved student achievement and teacher growth.

Area 2: Structure Learning Community Culture Indicator's Recommendation

The results presented in chapter 4 and the answers to the research questions presented in this chapter provided evidence that the structure of the LCCI is not complete. From the first version to the second version, we made considerable improvement in the elements and items. Model fits improved and individually the elements appeared quite solid. Simultaneously, more items began to cross load on to other elements. Theoretically, the items and elements have some overlap in what they are attempting to measure. For example, element D attempts to measure the functions of a collaborative team. Within the team are actions of interdependence, trust, data-based decision making, and continuous assessment that might overlap with school functions of the same element. The fact that some items load with other elements makes sense and provides additional evidence that the LCCI is an overall measure of PLCs. Similar to the idea of the bifactor model in simultaneously testing that both constructs are occurring together, the items may be indicating that what we are measuring is two ideas together—PLC and the respective element. Despite the theoretical rationale as to why some items are overlapping, evidence shows that the overall model is not as strong as was anticipated. The fit of the second order and bifactor models are only moderate to good. The ten elements need to be revisited and possibly some elements combined. As we had stated in chapter 4, two pairs had strong loadings together. The theory supports that they could be combined, but future research in studying the factor structure would be needed to confirm this theory. There is also evidence of some negative items not loading that also needs to be addressed. These structural issues of the LCCI lead to the second recommendation.

In making recommendations for future research regarding the structure of the LCCI, we would recommend that in order to strengthen the relationship among the elements, a deeper scrutinizing of the constituent items of the survey will show where there is overlap and similarities and what combinations or changes might be suggested. Semantics, phrasing, and terminology might be the cause for some items to cross load. These three areas might need to be revised to provide improved adherence to an element.

Second, we would recommend that the theory of the same elements be revisited to determine if two pairs of elements should be combined. This would potentially be a combination of element J with F and element I with E.

Third, we would recommend removing negative items that failed to load in the results of the EFA. Negative questions might help reduce agreement bias, but if the negative item is confusing to the participant and not phrased in direct opposite of the intended meaning, it might prove problematic (Colosi, 2005).

Area 3: Validation of the Learning Community Culture Indicator Recommendation

The results from the validation of the LCCI were encouraging. The results and analysis of the two administrations indicated that the LCCI was a valid and reliable instrument. Although the level of validity and reliability was not as strong as we had hoped, it did nonetheless show evidence of being a valid instrument. However, this study was delimited to two administrations in the same state. As described earlier, validation is not of the test but in how the data collected represents the validity (Shepard, 1993). This instrument needs to be tested outside the state of Utah to increase the external validity.

This study has indicated that any survey or measurement instrument needs to be refined and revalidated. In the literature, many instruments received single validations (Huffman &

Hipp, 2003; Olivier, 2003; SEDL, 2009) and often only a reliability estimate to show validity (Supovitz, 2002; Tien, Chung, & Tsai, 2005). This study has illustrated the systematic process involved in reworking and revising an instrument to reach a level of strong validity. Validity is not solely left to the loadings or fit indices. Validity also involves the theory and application outside of the models to ascertain its true validity. A survey must be continuously refined and revalidated as revisions are made.

A final area within the validation of the LCCI that needs to be addressed is the generalizability of the results. The LCCI measures the perceptions of individuals in a school to determine how they perceive the level at what they are functioning within the 10 PLC elements we had identified. The cumulative results might provide a reflection of the educators' perceptions for that day and time, but the results do not provide conclusive evidence that the educators were enacting these elements. The LCCI provides a snapshot of the perception of that school at that time, and the results for one school are not transferable to another school (Cziko, 1992). Longitudinal data might provide a better perception of the school over time. Triangulating with other forms of measurement might also provide an ability to reach a more solid conclusion. However, this survey provides only one form. These issues will be addressed in the final recommendation.

The first recommendation addressed the need to administer the survey to schools utilizing different models of PLC. As we addressed in the limitations of this study, administering the LCCI to schools using other models of PLCs would provide greater exposure and validity to the instrument.

The second recommendation addressing the issue of additional validation of the LCCI is to refine and revalidate the survey continually. Refining and revising the survey, while

simultaneously considering issues of validity and reliability, will provide greater clarity and organization of the survey. We recommend an additional revision of the LCCI based on this study's results and analysis. We would then recommend an additional validation to confirm the revisions. As mentioned earlier in the reliability section, we recommend additional measures of reliability and validity. Through constant refinement and revalidation, the LCCI will eventually reach the point at which it is a stronger and more valid survey instrument.

The final recommendation addresses the interpretation and application of the results from the LCCI for schools. Although this issue is not directly related to the validation of the LCCI, we recommend caution be used by educators who hope to generalize the results of the LCCI. The results from the LCCI are a snapshot of the perception of the faculty of the school. We recommend the following additional measures to support the findings of the LCCI: impartial outside observers to study the PLC culture of the school; a survey of the principal's perception in how he or she understands the school to be functioning; and longitudinal data collected to show changes and systematic collection of data to show improvement in student learning and other indicators of success in school.

Conclusion

From the answers to the research questions to the results of the factor analysis, we have presented substantial evidence to support the LCCI as a valid and reliable measure of PLCs in schools. A more important conclusion from this research is that the LCCI can be used in schools to help measure, build, and develop PLCs to improve student learning. The instrument could be valid and useful to schools, but the question is "So what?" This research came at a time when PLCs were being implemented almost rampantly in some schools and often without guidance and direction. PLCs are operating without substantial research that they do what they are

supposed to do, that is, improve learning for all students. This is the "so what." These results and conclusions provide schools, teachers, principals, and researchers with a measurement tool to establish PLCs as an effective reform by empirically connecting the presence of PLCs in schools with student achievement. This is pivotal information that will reconceptualize PLCs and their importance. Educators attempting to utilize PLCs need to determine if what they are doing is actually happening. The LCCI provides that information. Educators in PLC schools often claim that they can help students learn at higher levels based on the anecdotal stories of support in the literature, but this reform will be left to single stories until educators and researchers begin to tangibly connect the elements to student actions. Educators need evidence of which PLC elements are foundational. They need to know which elements have the greatest influence on student learning. PLCs need to move from a good idea to an established, supported, and researched model. Establishing this claim will not only verify what has been done in schools to help students succeed through implementing PLCs, it will also provide a call for others who have not considered or have even resisted PLCs to begin developing a PLC.

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APPENDIX A

Learning Community Culture Indicator LCCI 1.0

Teacher Version

This version of LCCI 1.0 is a teacher specific survey.

Directions:

Please respond to the following statements that pertain to your school's culture. Each statement offers a continuum of responses from 10 (agree strongly) to 0 (disagree strongly). Circle the point on the continuum that you believe is the best indicator of yours and your school's practice. Some responses are on a percentage continuum. "Not applicable" (NA) or "I don't know" may be options for some statements.

Your initial thought in answering the statement might be your most accurate response.

If you encounter terminology that is not clear to you, please use your best guess as to the term's definition.

After each question, you can offer any additional comments in the box provided. If you need more space for your comments, go to the end of the survey and complete your comments with the statement clearly identified.

Please be assured that your identity in taking this survey is anonymous, and your responses are kept in confidence with the researchers.

Sample Statements:

My school uses technology for instructional purposes.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	(8)	7	6	5	4	3	2	1	0

What percent of the time do you use technology in instructional practices?

100%-----90%-----80%-----70%-----60%-----50%-----(40%)-----30%-----20%-----10%----0%

Learning Community Culture Indicator, LCCI

Common mission, vision, values, and goals that are focused on teaching and learning

1A. Our school has a written mission statement. **(If yes proceed to #2A, if no or don't know proceed to #8B)**

[Yes] [Yes, but I do not know what it is] [No] [Don't Know]

Comments:

2A. The focus of our school mission statement is on student learning.

Agree Strongly		Agree Somewhat		Disagree Somewhat		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

3A. Our school mission statement is reviewed at least yearly.

Agree Strongly		Agree Somewhat		Disagree Somewhat		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

4A. Our school mission statement guides the decisions we make about student learning.

Agree Strongly		Agree Somewhat		Disagree Somewhat		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

5A. I participate in the refinement of our school's mission statement.

Agree Strongly		Agree Somewhat		Disagree Somewhat		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

6A. Indicate the percent of your instructional decisions that are based on your school mission statement.

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Comments:

7A. Our school-wide goals and objectives for student learning relate to our written mission statement.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

Decision-making based on data

8B. What percent of your instructional decisions are based on data from norm-referenced and/or criterion referenced tests? (If not applicable, select NA.)

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0% [NA]

Comments:

9B. What percent of your instructional decisions are based on data from common assessments made by your grade level or department instructional team? (If not applicable, select NA.)

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0% [NA]

Comments:

10B. What percent of your instructional goals are derived from multiple sources of data? (Some examples of assessment data are CRTs, norm-referenced tests, attendance records, drop out rates, tardy records, truancy records, performance indicators, rubrics, etc.) (If not applicable, select NA.)

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0% [NA]

Comments:

11B. What percent of the time do you use data that you have collected to determine if students are achieving instructional goals and objectives?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Comments:

Democratic Leadership that is Focused on Teaching and Learning

12C. I help make school-wide decisions that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

13C. My school administrators seek my input on issues that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

14C. In our school, I provide leadership on teams, committees, and other venues that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

15C. My school administrators seek out various points of view to make policies and decisions.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

5

16C. My school administrators use processes that are visible to me to make decisions and set goals regarding student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

Teaming that Is Collaborative

17D. I meet with a department or grade level instructional team that collaborates to improve teaching and learning. (If not applicable skip to question #26E)

[Yes] [No] [NA]

Comments:

18D. How often does your department or grade level instructional team meet to collaborate on improving teaching and learning?

[At least weekly] [At least every other week] [At least monthly] [About every 3 months] [Never]

Comments:

19D. My department or grade level instructional team sets goals and objectives that guide our efforts to improve teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

20D. My department or grade level instructional team meetings, which are focused on teaching and learning, are scheduled during the school day (common preparation periods, early out, late start).

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

21D. I have received professional training on collaboration.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

22D. My department or grade level instructional team has sufficient time to collaborate to improve teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

23D. What percent of your grade level or department instructional team's planning leads to actions that improve student learning?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Comments:

24D. Have you established written group norms in your grade level or department instructional teams? (Guidelines for how our team will function together)

[Yes] [No] (If the answer is no, proceed to 26E) [Don't know]

Comments:

25D. What percent of your meeting time do you follow group norms in your grade level or department instructional team meetings?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Comments:

Collaborative and Interdependent Culture

26E. I share my knowledge and expertise with other teachers to solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Comments:

27E. I seek out other teachers' expertise to help me solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Comments:

28E. Other teachers seek out my expertise to solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Comments:

29E. I collaborate with other teachers across curriculum and/or grade levels.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Comments:

30E. I share a responsibility with other teachers in this school for the learning of *all* students.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Comments:

31E. My school culture supports collaborative decision making.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

Academic success for all students with systems of prevention and intervention

32F. High quality education is provided for all students including those who may be at risk for academic failure.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

33F. Our school has enacted systems of prevention and intervention that reduce student failure.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

34F. What percent of your instruction is differentiated to accommodate individual student's needs?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Comments:

35F. I identify and assist students who have difficulty mastering core content by providing extra time, differentiated instruction, and support.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

36F. My department or grade level instructional team identifies and assists students who have difficulty mastering core content by providing extra time, differentiated instruction, and support.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

37F. In this school, we have developed student grouping practices that are inclusive of all students' abilities.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know
10	9		8		7		6		5		
4	3		2		1		0				X

Comments:

Professional Development that is teacher driven and embedded in daily work

38G. I participate in professional development that improves my classroom instruction.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

39G. I participate in professional development that is based on problems of teaching and learning in my school.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9		8		7		6		5		
4	3		2		1		0				X

Comments:

40G. I participate in professional development that is appropriate for my needs as an adult learner.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

10

41G. I participate in a variety of activities such as peer mentoring, discussion protocols, study groups, classroom visits, and team planning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

42G. I help plan professional development in my school

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

43G. Teachers in my school have shared their expertise in professional development.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

Principal Leadership That Is Focused on Student Learning

44H. When making decisions, my principal focuses on improving student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

45H. My principal inspires and motivates me to improve student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

46H. My principal supports the growth of my department or grade level instructional team towards improving student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

47H. My principal uses data to make decisions that lead to improving teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

48H. My principal helps me to use assessments to guide my instructional decisions.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9		8		7		6		5		
4	3		2		1		0				X

Comments:

49H. My principal supports my development towards improving learning for all students.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

High-trust embedded in school culture

50i. Teachers in this school care about me.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

Comments:

51i. Other teachers perceive me as a competent professional.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

52i. I feel comfortable sharing problems and engaging with teachers to solve them.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

53i. The trust I feel among teachers facilitates open decision making and problem solving.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

54i. I feel safe to take the risk of using innovative instructional methods.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

55i. Teachers in this school have professional integrity.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

13

56i. I feel safe to express my opinions, even when I am in the minority.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

Use of Continuous Assessment to Improve Learning

57J. I use assessment to guide my students in their learning.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Comments:

58J. I provide descriptive, meaningful feedback to help students improve their learning.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly	NA
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

59J. My department or grade level instructional team has identified common core learning standards on which we assess student learning.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly	NA
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

60J. My department or grade level instructional team has created common assessments.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly	Don't Know
10	9	8	7	6	5	4	3	2	1	0	X

Comments:

14

61J. My department or grade level instructional team uses common assessments to guide student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9		8		7		6		5		4		3		2		1		0		X

Comments:

62J. My department or grade level instructional team analyzes student work collaboratively.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	NA
10	9		8		7		6		5		4		3		2		1		0		X

Comments:

63J. What percent of the time in your department or grade level instructional team meetings do you collaboratively analyze summative assessment (such as CRTs, UPASS, UBSCT, etc.) to guide future instruction?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0% [NA]

Comments:

64J. What percent of planning time does your department or grade level instructional team use formative assessment (such as portfolios, rubrics, products, etc.) to guide instruction?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0% [NA]

Comments:

65J. My department or grade level instructional team has written essential learning standards in student friendly language.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly	Don't Know	NA
10	9		8		7		6		5		4		3		2		1		0	X	X

Comments:

66. Additional comments you would like to make.

Demographics

67. Gender

68. Age

69. Years teaching

70. Grade level and teaching assignment

71. Years in current position

72. Highest Earned Degree-(what, when, where)

73. Bachelor Degree-(what, when, where)

74. Certifications and Endorsements Held

75. List your current leadership assignments

Thank you for your participation!

APPENDIX B

Consent Form

Purpose of the Study

This research study is being conducted by Drs. Ellen J. Williams, Joseph Matthews, Sterling Hilton, and Ph. D. candidate, Courtney Stewart, from the Department of Educational Leadership and Foundations at Brigham Young University. This study will validate the Learning Community Culture Indicator (LCCI). This instrument was developed from a review of literature on learning communities in which ten elements were identified that are present in schools that function as learning communities. This instrument was designed to assess the depth and breadth in which these ten elements are present in schools.

Procedures

Teachers in your school are being asked to complete a questionnaire about your school because your principal is a participant in the BYU CITES Principals Academy. The questionnaire consists of 65 questions and will take approximately 60 minutes to complete. Questions focus on how the teachers in your school function across ten elements that make up a learning community. Questions will include details about how the teachers in your school function across ten elements that make up a learning community. This survey will also request basic demographics including position, education, experience, age, gender, and leadership positions.

Risks

There are minimal risks for participation in this study. However, you may feel some emotional discomfort when answering questions about your perceptions of your school culture or your principal's leadership practices. This discomfort will be minimized by the following measures:

- The survey is being administered by an individual outside of your school;
- All completed surveys will be kept anonymous;
- The data and demographic information that is collected will be reported only in aggregated form; and
- The completed instruments will be destroyed at the conclusion of this study, approximately June 30, 2007.

Benefits

Your participation will contribute to the validation of the LCCI instrument. This LCCI instrument will eventually provide a means by which your school will be able to identify the strengths and weaknesses of a learning community in your school.

Confidentiality

All information provided will remain confidential with the investigators and will only be reported to others as group data. All data collected from the LCCI will be kept in a locked storage cabinet and only those directly involved with the research will have access to the data. After the research is completed, the questionnaires and data will be destroyed.

Compensation

As a participant, you will receive no material compensation for completing the questionnaire. Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your status or standing with your school.

Questions about the Research

If you have questions regarding this study, you may contact Ellen Williams at 801/652-8698 or e-mail at ellen_williams@byu.edu or Joseph Matthews at 801/422-4298 or e-mail at Joe_matthews@byu.edu.

Questions about your Rights as Research Participants

If you have questions you do not feel comfortable asking the researcher, you may contact Dr. Renea Beckstrand, IRB Chair, 422-3873, 422 SWKT, renea_beckstrand@byu.edu.

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Signature:_____ Date:_____

APPROVED EXPIRES
JAN 2 5 2007 - JAN 2 4 2008

APPENDIX C

INSTITUTIONAL REVIEW BOARD FOR
HUMAN SUBJECTS

January 25, 2007

Ellen Williams
306R MCKB
Campus Mail

Dear Dr. Williams,

Thank you for your recent correspondence concerning your protocol entitled "Measuring Multi-Dimensional Application of Learning Communities in Utah Schools." The proposal has been assigned the following number: F07-0017. The research appears to pose minimal risk to human subjects and meets the Federal guidelines.

You are approved to begin your research. This approval is good until January 24, 2008 (a year from the date it was approved). A few months before this date we will send out a continuing review form. There will only be two reminders. Please fill this form out in a timely manner to ensure that there is not a lapse in your approval.

Enclosed is a date stamped consent form. No other consent form should be used.

Please notify Nancy Davis, (801) 422-2970, A-285 ASB, of any changes made in the instruments, consent form, or research process before instigating the alterations, so that we can approve them before the change is implemented.

If you have any questions, please let us know. We wish you well with your research!

Sincerely,

Dr. Renea L. Beckstrand, Chair /
Nancy A. Davis, CIM, Administrator
Institutional Review Board for Human Subjects
RLB/cfc

Enclosure

APPENDIX D

Second Version of LCCI

BYU EDLF

Learning Community Culture Indicator
LCCI 2.0

Teacher Version

This version of LCCI 1.0 is a teacher specific survey.

Directions:

Please respond to the following statements that pertain to your school's culture. Each statement offers a continuum of responses from 10 (agree strongly) to 0 (disagree strongly). Circle the point on the continuum that you believe is the best indicator of yours and your school's practice. Some responses are on a percentage continuum. "Not applicable" (NA) or "I don't know" may be options for some statements.

Your initial thought in answering the statement might be your most accurate response.

If you encounter terminology that is not clear to you, please use your best guess as to the term's definition.

After each question, you can offer any additional comments in the box provided. If you need more space for your comments, go to the end of the survey and complete your comments with the statement clearly identified.

Please be assured that your identity in taking this survey is anonymous, and your responses are kept in confidence with the researchers.

Sample Statements:

My school uses technology for instructional purposes.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

What percent of the time do you use technology in instructional practices?

100%-----90%-----80%-----70%-----60%-----50%-----40%-----30%-----20%-----10%----0%

Learning Community Culture Indicator, LCCI

Common mission, vision, values, and goals that are focused on teaching and learning

1A. Our school mission is focused on student learning.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

2A. Our school has a mission that guides our collective efforts to improve student learning.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

3A. Our school mission is seldom reviewed.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

4A. Our school vision describes a future in which more students achieve at higher levels.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

5A. I participate in the refinement of our school's mission and vision.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

6A. Our school-wide goals and objectives for student learning relate to our school vision.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

Decision-making based on data

7B. I use summative test data, such as norm-referenced and/or criterion referenced tests, to make instructional decisions.

Agree Strongly — Agree — Agree Somewhat — Disagree Somewhat — Disagree — Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

8B. What percent of your instructional decisions are based on data from common assessments made by your instructional team?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

9B. What percent of your instructional goals are derived from multiple sources of data? (Some examples of assessment data are CRTs, norm-referenced tests, attendance records, drop out rates, tardy records, truancy records, performance indicators, rubrics, etc.)

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

10B. What percent of the time do you use data that you have collected to determine if students are achieving instructional goals and objectives?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

Participative Leadership that is Focused on Teaching and Learning

12C. Teachers in my school help make decisions that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

13C. My school administrator(s) seldom seek teachers' input on issues that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

14C. In my school, teachers provide leadership on teams, committees, and other venues that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

15C. My school administrator(s) use open processes to make decisions regarding student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

16C. Most decisions that relate to teaching and learning in this school are made top-down.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

17C. In this school there are many layers of bureaucracy that inhibit teachers in making good decisions regarding teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
4	3		2		1		0			

18C. Teachers exercise leadership collaboratively with the principal on issues that relate to improving teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Teaming that Is Collaborative

19D. I am on an instructional team that collaborates to improve teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

20D. How often does your instructional team meet to collaborate on improving teaching and learning?

[More than once a week] [At least weekly] [At least every other week][At least monthly] [About every 3 months] [Never]

21D. My instructional team sets goals and objectives that guide our efforts to improve teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

22D. My instructional team meetings, which are focused on teaching and learning, are scheduled during the school day (common preparation periods, early out, late start).

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

23D. I have participated in professional development to learn various skills of collaborating to improve student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

24D. My instructional team has sufficient collaboration time to improve teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

25D. What percent of your instructional team's planning leads to actions that improve student learning?

100%-----90%-----80%-----70%-----60%-----50%------40%-----30%-----20%-----10%----0%

26D. My team seldom follows group norms in our instructional team meetings?

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

27D. My principal coaches and mentors my instructional team to help us improve student learning more effectively.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

28D. My instructional team reflects on finding instructional solutions that help all students improve their learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

29D. During our regular meetings, my instructional team shares data from teacher-made common assessments about specific students

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

30D. During our regular meetings, my instructional team determines how we will provide differentiated instruction for students who performed below grade level, on grade level, and above grade level.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

31D. During our regular meetings, my instructional team selects one or two specific learning targets for students to master

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

32D. During our regular meetings, my instructional team brainstorms to find the most effective instructional approaches to help students master selected learning targets

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

33D. During our regular meetings, my instructional team creates teacher-made common assessments to assess student achievement of selected learning targets

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	4	3		2		1		0

Interdependent Culture

34E. I share my knowledge and expertise with other teachers to solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

35E. I seek out other teachers' expertise to help me solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

36E. Other teachers do not seek out my expertise to solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

37E. I share a responsibility with all teachers in this school for the learning of *all* students.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

38E. My school culture supports collaboration around teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

39E. My colleagues and I mentor and coach each other as we solve problems related to practice.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

40E. Teachers in this school spontaneously come together to solve problems of teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

41E. Teachers in this school share resources that relate to teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
		4		3		2		1		0

Academic success for all students with systems of prevention and intervention

42F. At my school, high quality instruction is provided for all students including those who may be at risk for academic failure.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

43F. My school has enacted systems for identifying students who are at risk for academic failure.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

44F. My school has enacted systems for intervening with at-risk students to reduce academic failure

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

45F. Teachers in my school reteach students who do not master core concepts.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

46F. My instructional team assists students who have difficulty mastering core content by providing extra teacher-directed learning time.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

47F. My instructional team assists students who have difficulty mastering core content by providing differentiated instruction.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

48F. My instructional team assists students who have difficulty mastering core content by providing extra support.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

Professional Development that is teacher driven and embedded in daily work

49G. My view of professional development is that it is largely a formal meeting in which I receive information and skills from an individual who has a particular expertise.

Agree Strongly		Agree	Agree Somewhat	Disagree Somewhat		Disagree	Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

50G. In my professional development, I engage in activities that improve my classroom instruction.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

51G. My professional development is not based on authentic problems of teaching and learning in my school.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

52G. Teachers in this school participate in peer coaching.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

53G. Teachers in this school participate in lesson studies.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

54G. Teachers in this school make classroom visits to observe other instructional practices

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1			

55G. Professional development activities in this school are teacher driven.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

56G. As a result of our collaboration, my instructional team identifies instructional practices which we would like to learn.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

57G. Teachers in my school share their expertise in improving teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

Principal Leadership That Is Focused on Student Learning

58H. When making decisions, my principal focuses on improving student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9		8		7		6		5	
	4		3		2		1		0	

59H. My principal does not mentor me in improving student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

60H. My principal coaches my instructional team towards improving student learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

61H. My principal uses data to make decisions that lead to improving teaching and learning.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

62H. My principal mentors me in using assessments to guide my instructional decisions.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

63H. My principal supports my development towards improving learning for all students.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

High-trust embedded in school culture

64i. Teachers in this school care about me.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

65i. Other teachers perceive me as a competent professional.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

66i. I do not feel comfortable sharing problems and engaging with teachers to solve them.

Agree Strongly		Agree		Agree Somewhat		Disagree Somewhat		Disagree		Disagree Strongly
10	9	8	7	6	5	4	3	2	1	0

67i. The trust I feel among teachers facilitates open decision making and problem solving.

Agree		Agree		Disagree		Disagree

Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

68i. I feel safe to take the risk of using innovative instructional methods.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

69i. Teachers in this school have professional integrity.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

70i. I do not feel safe to express my opinions when I am in the minority.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

Use of Continuous Assessment to Improve Learning

71J. My instructional team uses data from multiple forms of assessment to guide students in their learning.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

72J. I use data from multiple forms of assessment to guide my students in their learning.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

73J. I provide descriptive, meaningful feedback to help students improve their learning.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

74J. My instructional team has identified common core learning standards on which we assess student learning.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

75J. My instructional team has not created common assessments.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly
10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

76J. My instructional team uses data from common assessments to guide student learning.

Agree Agree Disagree Disagree
Strongly Agree Somewhat Somewhat Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

77J. My instructional team analyzes student work

Agree Strongly | Agree | Agree Somewhat | Disagree Somewhat | Disagree | Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

78J. My instructional team uses data from summative assessments (such as CRTs, UPASS, UBSCT, etc.) to guide future instruction that improves student learning

Agree Strongly | Agree | Agree Somewhat | Disagree Somewhat | Disagree | Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

79J. My instructional team uses data from formative assessment (such as portfolios, rubrics, products, etc.) to guide instruction that improves student learning

Agree Strongly | Agree | Agree Somewhat | Disagree Somewhat | Disagree | Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

80J. My instructional team has transformed learning standards into language that students understand.

Agree Strongly | Agree | Agree Somewhat | Disagree Somewhat | Disagree | Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

81J. My instructional team continuously assesses student learning to guide instruction.

Agree Strongly | Agree | Agree Somewhat | Disagree Somewhat | Disagree | Disagree Strongly

10----------9----------8----------7----------6----------5----------4----------3----------2----------1---------0

82. Additional comments you would like to make.

Demographics

79. Gender

80. Age

81. Years teaching

82. Grade level and teaching assignment

83. What is the primary instructional team to which you belong

84. Years in current position

85. Highest Earned Degree-(what, when, where)

86. Bachelor's Degree-(what, when, where)

87. Certifications and Endorsements Held

88. List your current leadership assignments

Thank you for your participation!

Second Version of LCCI (online)

BYU
BRIGHAM YOUNG
UNIVERSITY

Default Question Block

Consent Form

This research study is being conducted by Dr. Joe Matthews, Dr. Ellen. J. Williams, and Ph.D. candidate and graduate assistant, Courtney Stewart. Your district administrators and school principal have agreed to allow you the opportunity to participate in this study. The purpose of this study is to examine your school's and district's participation in a professional learning community.

Procedures

After reading this letter of consent to participate in the study, you will be given the choice below to click the appropriate box as to consent to go forward or not to participate.

- If you do not consent, you will be exited from the screen.
- If you consent, you will then be directed to the Learning Community Culture Indicator.
- After completion of the survey, you will then be asked to submit your responses.
- Investigators will collect data from LCCI survey and report it in aggregate. No school or district official will see your individual responses.

Risks/Discomforts

There are minimal risks for participation in this study. However, you may feel some emotional discomfort when answering questions about your perceptions of the school's culture and leadership practices. This discomfort should be minimized since the data will be analyzed only by the investigators, and your individual responses will remain anonymous.

Benefits

Findings from this study may contribute to the scholarly work that is being done by researchers who are investigating the cultural shifts schools make as they mature into functioning learning communities. Educators in your school might be able to identify strengths and weaknesses as to the total school involvement in a professional learning community.

Confidentiality

All information provided will remain confidential and will only be reported in aggregate with no personal or individual identifying information attached.
All identifying information with direct quotations will be kept confidential. The data will be secured during the study in a locked cabinet and office. The data will be secured for three years following the study after which the data will be destroyed.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your status or standing with your school.

Questions about the Research

If you have questions regarding this study, you may contact Joseph Matthews (801) 422-6388 or e-mail him at Joe_matthews@bvu.edu or Ellen J. Williams at (801) 652-8698 or e-mail her at ellen_williams@bvu.edu.

Questions about your Rights as Research Participants

If you have questions that you do not feel comfortable asking the researcher, you may contact Christopher Dromey, PhD, IRB Chair, 422-6461, 133 TLRB, christopher_dromey@byu.edu

- ○ I agree to participate
- ○ I do not agree to participate

Gender

Age (Optional)

How many years have you taught?

What is your current grade level and teaching assignment?

Grade Level

Assignment

In which primary collaboration team do you belong?

Grade Level

Content Area

In which school do you teach?

School

How many years have you taught in your current position?

What is your highest earned degree?

Year	
Degree	
Where	

LCCI part 1

Our school mission is focused on student learning

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Our school has a mission that guides our collective efforts to improve student learning

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Our school mission is seldom reviewed

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Our school vision describes a future in which more students achieve at higher levels.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I participate in the refinement of our school's mission and vision.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Our school-wide goals and objectives for student learning relate to our school vision.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I use summative test data, such as norm-referenced and/or criterion referenced tests, to make instructional decisions.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

What percent of your instructional decisions are based on data from common assessments made by your collaboration team?

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

What percent of your instructional goals are derived from multiple sources of data?(CRTs, norm-referenced tests, attendance records, drop out rates, tardy records, performance indicators, rubrics, etc.)

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

What percent of the time do you use data that you have collected to determine if students are achieving instructional goals and objectives?

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

Teachers in my school help make decisions that relate to teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My school administrator(s) seldom seek teachers' input on issues relating to teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

In my school, teachers provide leadership on teams, committees, and other venues that relate to teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My school administrator(s) use open processes to make decisions and set goals regarding student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Most decisions that relate to teaching and learning in this school are made top-down

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

In this school there are many layers of bureaucracy that inhibit teachers in making good decisions regarding teaching and learning

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers exercise leadership collaboratively with the principal on issues that relate to improving teaching and learning

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I am on a collaboration team that collaborates to improve teaching and learning

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

How often does your collaboration team meet to collaborate on improving teaching and learning?

More than once a week	At least weekly	At least every other week	At least monthly	About every 3 months	Never
○	○	○	○	○	○

My collaboration team sets goals and objectives that guide our efforts to improve teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team meetings, which are focused on teaching and learning, are scheduled during the school day (common preparation periods, early out, late start).

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I have participated in professional development to learn various skills of collaborating to improve student learning.

Agree	(9)	Agree (8)	(7)	Agree	(5)	Disagree	(3)	Disagree (2)	(1)	Disagree

Strongly (10)				Somewhat (6)		Somewhat (4)				Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team has sufficient collaboration time to improve teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

What percent of your collaboration team's planning leads to actions that improve student learning?

100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
○	○	○	○	○	○	○	○	○	○	○

My team seldom follows group norms in our collaboration team meetings?

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal coaches and mentors my collaboration team to help us improve student learning more effectively.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team reflects on finding instructional solutions that help all students improve their learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

During our regular meetings, my collaboration team shares data from teacher-made common assessments about specific students.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

During our regular meetings, my collaboration team determines how we will provide differentiated instruction for students who performed below grade level, on grade level, and above grade level.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

During our regular meetings, my collaboration team selects one or two specific learning targets for students to master.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

During our regular meetings, my collaboration team brainstorms to find the most effective instructional approaches to help students master selected learning targets.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

During our regular meetings, my collaboration team creates teacher-made common assessments to assess student achievement of selected learning targets.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

LCCI part2

I share my knowledge and expertise with other teachers to solve problems of teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I seek out other teachers' expertise to help me solve problems of teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Other teachers do not seek out my expertise to solve problems of teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I share a responsibility with all teachers in this school for the learning of *all* students.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My school culture supports collaboration around teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My colleagues and I mentor and coach each other as we solve problems related to practice.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school spontaneously come together to solve problems of teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school share resources that relate to teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

At my school, high quality instruction is provided for all students including those who may be at risk for academic failure

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My school has enacted systems for identifying students who are at risk for academic failure.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My school has enacted systems for intervening with at-risk students to reduce academic failure

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)

○	○	○	○	○	○	○	○	○	○	○

Teachers in my school reteach students who do not master core concepts

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team assists students who have difficulty mastering core content by providing extra teacher-directed learning time

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team assists students who have difficulty mastering core content by providing differentiated instruction.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team assists students who have difficulty mastering core content by providing extra support.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

In my professional development, I engage in activities that improve my classroom instruction.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My professional development is not based on authentic problems of teaching and learning in my school.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school participate in peer coaching.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school participate in lesson studies.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school make classroom visits to observe other teachers' instructional practices.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Professional development activities in this school are teacher driven.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

As a result of our collaboration, my instructional team identifies instructional practices which we would like to learn.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in my school share their expertise on teaching and learning.

Agree	(9)	Agree (8)	(7)	Agree	(5)	Disagree	(3)	Disagree (2)	(1)	Disagree

Strongly (10)				Somewhat (6)		Somewhat (4)				Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

LCCI part 3

When making decisions, my principal focuses on improving student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal does not mentor me in improving student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal coaches my instructional team towards improving student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal uses data to make decisions that lead to improving teaching and learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal mentors me in using assessments to guide my instructional decisions.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My principal supports my development towards improving learning for all students.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school care about me.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Other teachers perceive me as a competent professional.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I do not feel comfortable sharing problems and engaging with teachers to solve them.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

The trust I feel among teachers facilitates open decision making and problem solving.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I feel safe to take the risk of using innovative instructional methods.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

Teachers in this school have professional integrity.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I do not feel safe to express my opinions when I am in the minority.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team uses data from multiple forms of assessment to guide students in their learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I use data from multiple forms of assessment to guide my students in their learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

I provide descriptive, meaningful feedback to help students improve their learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team has identified common core learning standards on which we assess student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team has not created common assessments.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team uses data from common assessments to guide student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team analyzes student work.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team uses data from summative assessments (such as CRTs, UPASS, UBSCT, etc.) to guide future instruction that improves student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team uses data from formative assessment (such as portfolios, rubrics, products, etc.) to guide instruction that improves student learning.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team has transformed learning standards into language students understand.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○

My collaboration team continuously assesses student learning to guide instruction.

Agree Strongly (10)	(9)	Agree (8)	(7)	Agree Somewhat (6)	(5)	Disagree Somewhat (4)	(3)	Disagree (2)	(1)	Disagree Strongly (0)
○	○	○	○	○	○	○	○	○	○	○