

How Professional Learning Communities Create and Sustain Teacher Change in Practice – A Grounded Theory Study of Conditions and Contexts

A thesis submitted in fulfilment of the
requirements for the award of Doctor of
Philosophy

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Declaration

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A handwritten signature in black ink, reading "Barbara Lee Scharz McDonald". The signature is written in a cursive style and is positioned above a horizontal line.

Barbara Lee Scharz McDonald

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Summary

This United States-based study uses a grounded theory approach to develop a theoretical understanding of change in teacher practice. This change in practice is mediated through a specific type of community of practice developed using Professional Learning Community goals and activities.

Traditionally, professional change was driven by deficit-focused professional development events delivered out of context. Current research on teaching-based professional development is coming to the conclusion that context, collaboration, and immersion are critical elements of effective professional development. Even with the inclusion of these elements, traditional professional development methods are not succeeding at creating the change that is needed.

There currently exists a situated learning model of professional development that has quantified its ability to improve student outcomes: a Professional Learning Community (PLC). In Professional Learning Communities the context of the school district and school determine what needs to be learned. Collaboration within the community drives teacher immersion into student learning. While there is excellent research around the organizational development aspects that create a PLC, there is little-to-no research on the context and conditions that change teacher practice.

PLC design is based on organizational change and organizational learning theory. There is little reference, in the key PLC literature, to communities of practice theory. However, the analysis in this study demonstrates that successful PLCs become a specific type of community of practice. It is important to recognize the structure and impact of communities of practice theory in PLCs in order to understand how the organizational development and learning activities of PLCs create learning and change in teacher practice.

The purpose of this study is to develop a theoretical understanding of the context and conditions within PLCs that create and sustain change in teacher practice. The need to develop theoretical understanding of the changes in teacher practice that occur during the organizational development of the PLC drove the selection of grounded theory as the research methodology.

The study included PLCs from a primary school district as well as one school PLC that had documented success in improving student performance. Additionally, the researcher sought out non-technical literature on related concepts. Data was primarily collected through 15 semi-structured interviews, observations, and non-technical literature. Theoretical sampling between multiple PLCs, observations, and non-technical literature drove the data collection. Concurrent to data collection, constant comparison of the data was achieved through open, axial, and selective coding. These activities allowed the researcher to move from conceptualization of the data to an emerging, substantive, mid-range theory with explanatory and predictive power.

The main contribution of this research study is a substantive, mid-range theory that explains how effective PLCs form and create teacher change in practice that improves student performance. This change is demonstrated through a three-phase model that explains the process and structure of the change in teacher practice as well as uses communities of practice theory to explain the conditions and context for teacher learning that changes practice. The significance of this study are 1) it provides conditions and context for creating and sustaining teacher change through PLCs; 2) it extends the existing literature by adding the lens of community of practice theory to explain how and where learning happens.

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Chapter 1: Introduction

1.1. Background and Context

Traditionally, professional change has been driven by deficit-focused professional development events delivered out of context (Borko, 2004; Darling-Hammond & Richardson, 2009; Wilson & Berne, 1999). Teachers are asked to participate in half-day or full-day seminars where an expert (in whatever perceived deficit is currently under scrutiny) explains a better way. The expectation is that this will change teacher attitudes and beliefs that will in turn change the way they teach.

However, in the United States, the current reform climate requires some critical changes in the way teachers teach (Darling-Hammond & McLaughlin, 1995; Louis & Kruse, 1995; Milbrey McLaughlin et al., 2003). The rapid and pervasive rise in ICT, new mathematics and science pedagogy, and United States governmental regulations are some key examples of issues that are driving reforms. Each of these issues carries its own reform requirement. For example the use of ICT impacts and is impacted by content and pedagogical knowledge (J. B. Harris & Hofer, 2011) while standards developed based on new pedagogies are being implemented (*Home / Common Core State Standards Initiative*, n.d.).

Traditional methods of teacher professional development are proving ineffective in meeting the reform requirements (Darling-Hammond & McLaughlin, 1995; Louis & Kruse, 1995; Tam, 2015). For example, the drive to implement technology in the classroom (an identified deficit) has led to professional development of ICT as a standalone element of student experience. However, Harris, Mishra, and Koehler (2009) have created an integrated framework that ties technological knowledge, pedagogical knowledge, and content knowledge into a practical tool that aids teachers' ICT implementations.

Current research on teaching-based professional development is coming to the conclusion that context, collaboration, and immersion are critical elements of effective professional development (Darling-Hammond et al.,

2017; Laura M. Desimone et al., 2002; L. J. Lawrence & Lawrence, 1999; McClain & Cobb, 2004; Ward & Darling, 1996). Even with the inclusion of these elements, traditional professional development methods are not succeeding at creating the change that is needed (Richard DuFour, 2007; R. Wei et al., 2009).

There currently exists a model of professional development that has quantified its ability to improve student outcomes: a Professional Learning Community (PLC) (Vescio et al., 2008). The theoretical underpinning of PLCs is organizational learning and management theory. In Professional Learning Communities the context of the school district and school determine what needs to be learned. Collaboration within the community drives teacher immersion into student learning.

While there is excellent research around the organizational development aspects that create a PLC, there is little-to-no research on the context and conditions within the PLC that change teacher practice.

The purpose of this study was to understand the context and conditions within PLCs that create and sustain change in teacher practice and, from that understanding, create a theory of teacher change in practice with explanatory and predictive power.

1.2. Research Problem

The focus of this study is on how existing Professional Learning Communities in the United States create and sustain change in teacher practice. The goal of the study is to identify a theory of teacher change in practice with predictive and explanatory power. From this, a framework for understanding the processes and structure of the change in teacher practice will emerge.

1.2.1. Preliminary Research Questions

The researcher began the study with this preliminary question:

- What is a theory that explains the ways in which a teacher changes practice within a PLC?

1.3. Context of the Study

The context of this study is successful, district-wide implementations of a Professional Learning Community in the United States. The districts chosen demonstrated success by meeting the requirements for inclusion on the All Things PLC website (*Apply to Be a Model PLC | All Things PLC | Powered by Solution Tree*, n.d.). Those requirements include:

- Demonstrate a commitment to PLC concepts.
- Implement those concepts for at least three years.
- Present clear evidence of improved student learning.
- Explain the practices, structures, and culture of the school or district, and submit it for consideration to the PLC Review Committee using our online submission process.
- Update school or district information on the site each year to show your data continues to meet the criteria of a model PLC.

Data was collected via 15 unstructured telephone interviews, three days of observation, and three white papers on similar topics.

1.4. Method–Grounded Theory

The purpose and associated questions of a study drive the choice of methods (J. W. Creswell, 2009; N. K. Denzin & Lincoln, 2011). As the purpose of this study is to generate a theory of sustained change in teacher practice, the research methodology must be able to generate a theory within a socially constructed, participant-centered, context-sensitive environment. The methodology that best addresses these requirements is grounded theory. The full requirements and analysis that led to choosing grounded theory can be found in Section 3.2 The research rationale and method.

Grounded theory is an approach to qualitative research that is widely used in social sciences disciplines such as nursing, education, and business. Designed for sociological research, its aim is generating theories of process and structure in social settings. As defined by Strauss and Corbin (1998, p. 12) grounded theory is a “theory that was derived from data, systematically gathered and analyzed through the research process. In this method, data collection, analysis, and eventual theory stand in close relationship to one another.” The intent of the grounded theory approach is to develop an account

of a phenomenon that identifies the major constructs, categories (in grounded theory terms), their relationships, and the context and process, thus providing a theory of the phenomenon that is much more than a descriptive account (Becker, 1993).

Grounded theory, therefore, is a primarily inductive (as opposed to deductive) research methodology whereby the researcher starts analyzing data as soon as it is collected to constantly compare data as it is gathered. It requires the researcher to be flexible and comfortable with ambiguity, since the emerging patterns and relationships are not always obvious (Corbin & Strauss, 2008; Heath & Cowley, 2004; Strauss & Corbin, 1998).

Grounded theory methods impact the way the research is reported. The thesis format commonly used is based on hypothetico-deductive research processes (J. Creswell, 2008; Phillips & Pugh, 2005; Roy Suddaby, 2006), and is not necessarily supportive of the process of grounded theory research. The two main differences for documenting grounded theory research involve the literature review and the research design. In grounded theory, one does not complete a thorough analysis of the literature about the phenomenon. This is to avoid forcing the data into a particular, existing theory (Barney G. Glaser, 1998; Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998). Additionally, just as the theory emerges, so does the process by which the researcher conducts the research. When documenting most hypothetico deductive research, the researcher describes the design of the research that lead to the researcher's findings. The emergent nature of the grounded theory process requires the researcher to document her actions after the fact. The goal (of what is often a narrative format) is to provide evidence that the process was followed and that appropriate rigor was employed (Gasson, 2004; Roy Suddaby, 2006). These adjustments are described in Section 1.7 Structure of this Thesis.

1.5. Findings

The finding of this study is a theory, with explanatory and potentially predictive power, that outlines the conditions and contexts for creating and sustaining PLCs in order to facilitate teacher change in practice. The theory identifies a three-phase framework to use when designing and developing PLCs that change teacher practices. The framework provides process and

structure for each phase that result in changes in teacher practice. The theory supports many of the affordances (the Four Critical Questions, Common formative assessments, Collaboration, etc.) DuFour, Eaker, and Many (2006) have identified as PLC actions that in turn create the PLC. Additionally, as discussed in the comparison to the literature, the theory confirms and expands on critical attributes of successful PLCs.

An additional finding of this study includes the discovery that PLCs that create and sustain change in teacher practice are also a particular type of community of practice. This theory adds the lens of community of practice theory to provide context for organizational development activities that lead to learning within the PLC affordances and critical attributes. This discovery is fundamentally different from the existing literature on PLCs.

1.6. Significance of research

The significance of this study is that it incorporates community of practice theory into Professional Learning Community theory in order to add to the body of knowledge about the conditions and contexts by which Professional Learning Communities change teacher practice that improve student learning. Since PLCs have been developed primarily using organizational learning and organizational management theories, the addition of communities of practice theory fills gaps in understanding how and when teachers learn within a PLC. This, in turn, assists with the design of learning experiences.

1.7. Structure of this Thesis

As discussed in 1.4 Method–Grounded Theory, this thesis will vary from a typical, hypothetico-deductive thesis. The chapter descriptions below provide an overview of each chapter.

Chapter 2: Literature Review. This chapter will provide a sensitizing literature review to provide the researcher with a general understanding of the field rather than a complete analysis of the existing literature in order to identify a specific issue to study. As per the Grounded Theory approach, a deeper analysis of the existing literature becomes part of the data analysis process and will be discussed in Chapters 5 and 6.

Chapter 3: Methodology. This chapter will include an analysis of the rationale for choosing grounded theory, a general discussion of the grounded theory method, a description of the grounded theory process, a critique of the use of grounded theory, and will conclude with a narrative account of the research design.

Chapter 4: Open and Axial Coding. This chapter is included to provide evidence of the rigor with which the research is conducted by providing:

- 1) The key result of the narrative account of the research process.
- 2) The basis of the analysis for the emerging theory.

Chapter 5: Selective Coding and Theory Generation. This chapter provides the theory that resulted from the study and reinforces the rigor of the grounded theory process that was used. It also includes discussion about generating and using theory and places this research within the context described.

Chapter 6: Comparison to the Literature and Discussion. This chapter provides a comparison of the theory presented in Chapter 5 to similar concepts in the literature. It also provides a discussion of the role of communities of practice in the formation of the PLC. Lastly, it provides a discussion of how this theory adds to the literature by providing the conditions and context that recent literature reviews seek.

Chapter 7: Review of Findings. This chapter provides summaries of the conclusions, findings, and contributions of this research. It also provides a description of the significance of this research and its limitations. It provides some guidance for future research and a narrative of this researcher's experience with grounded theory.

Chapter 2: Literature Review

2.1. Introduction

Since inductive, grounded theory research requirements for literature reviews vary from typical hypothetico-deductive literature review requirements, this chapter will discuss the difference in requirements for deductive versus inductive research. It will then use Cooper's Taxonomy of Literature Reviews to justify the approach taken. The chapter concludes with an appropriate review of the literature for this study.

2.2. Literature Review Requirements

2.2.1. Deductive Requirements

A substantive, thorough literature review is a critical piece of a research thesis, because it provides the basis for the structure and purpose of the research study (Boote & Beile, 2005; J. W. Creswell, 2005). In many traditional, hypothetico-deductive research methodologies the role of the literature review in a PhD thesis is to "demonstrate that you have a fully professional grasp of the background theory to your subject" through a thorough analysis and synthesis of the existing literature (J. W. Creswell, 2005; Phillips & Pugh, 2005; Randolph, 2009). Additionally, the traditional literature review confirms that the researcher is not replicating someone else's work (J. W. Creswell, 2009). A thorough analysis and synthesis of the existing literature is particularly important when doing educational research as there are few subfields in education that have a history of research that builds on itself (Boote & Beile, 2005). Therefore, the researcher must use the literature review to build a foundation for the research at hand when conducting a deductive study.

2.2.2. Inductive Requirements

For grounded theory research, Glaser and Strauss initially indicate that a researcher should "literally ignore the literature of theory and focus on the

area under study, in order to assure that the emergence of categories will not be contaminated...”(1967, p. 37) However, as Strauss began working with Juliet Corbin, they determined that a (limited or specific) form of the literature review was useful (Strauss & Corbin, 1998). Glaser (1998) has maintained his position to never conduct theoretical literature reviews before the research begins though he states they do become appropriate as data once the new theory begins to emerge (Barney G. Glaser, 2002a; Heath & Cowley, 2004; Kelle, 2005).

Strauss and Corbin assert that the researcher may do a light, theoretical review prior to research beginning that provides “theoretical sensitivity” as well as initial research questions. This position, on the role of the literature review, is a divergence among the founders of grounded theory. However, Strauss and Corbin agree with Glaser that the researcher should also include theoretical literature reviews as data once the new theory begins to emerge.

2.2.3. Literature Review Approach

As the literature review has a specific form and is a critical part of a hypothetico-deductive research project, and hypothetico-deductive research is the standard in most universities, a PhD student doing grounded theory must adjust and account for any differences in the literature review presented. Luckerhoff and Guillemette (2011) indicate that the main issue with grounded theory literature reviews is that neither qualitative nor quantitative committees “think it is possible to suspend references to theory.” Strauss and Corbin (2008, p. 37) suggest some reasons for which a general understanding of the literature could be used in a grounded theory research project.

- It can enhance sensitivity.
- It can provide questions for initial observations and interviews.
- It can suggest areas for theoretical sampling.

Luckerhoff and Guillemette (2011, p. 404) conclude that a researcher needs to explain that a thorough review of the theoretical literature that “allows researchers to define the issues, the eventual hypotheses and the framework of analysis” is not appropriate. However, they agree with Strauss and Corbin in indicating that documenting reading in order to identify questions for initial observations and interviews is entirely appropriate. Therefore, the literature review in this paper will follow Strauss and Corbin’s recommendation to

document the researcher's reading in order to identify questions for initial observations and interviews.

Randolph (2009) expands on Cooper's Taxonomy of Literature Reviews (Table 1) as a way to assist a researcher (at the beginning of the process) to identify the appropriate components of the literature review at hand. Since grounded theory research should be approached *tabula rasa*, doing a thorough analysis and synthesis of the existing literature or previous methods on the topic would be inappropriate. Focusing on a given theory would also create the potential for the researcher to force the data to fit into that theory. Therefore, the focus of this literature review will be areas potentially central to the research such as teacher professional development practices, teacher change practices, and situated learning theory practices, which Randolph indicates is a method for identifying an area that may not have been explored deeply yet.

As demonstrated, in column three of Table 1: Cooper's Taxonomy of Literature Reviews and Analysis for this Research, the goal of this literature review is the identification of central issues of teacher change through teacher professional development. Based on Cooper's Taxonomy of Literature Reviews, the perspective will follow qualitative tradition and espouse a position upon which to base the primary research phenomenon. The coverage of this literature review will be of central or pivotal articles to create theoretical sensitivity around teacher professional development methods to create change.

Table 1: Cooper's Taxonomy of Literature Reviews and Analysis for this Research

Characteristic	Categories	Approach for This Grounded Theory Literature Review
Focus	<ul style="list-style-type: none"> • Research outcomes • Research methods • Theories • Practices or applications 	The focus of this literature review will be teacher professional development practices, teacher change practices, and situated learning theory practices.
Goal	<ul style="list-style-type: none"> • Integration <ul style="list-style-type: none"> (a) Generalization (b) Conflict resolution (c) Linguistic bridge-building • Criticism • Identification of central issues 	The goal of this literature review is to identify central issues of teacher change through teacher professional development.

Characteristic	Categories	Approach for This Grounded Theory Literature Review
Perspective	<ul style="list-style-type: none"> • Neutral representation • Espousal of position 	The perspective of this literature review will be to espouse a position upon which to base the primary research phenomenon.
Coverage	<ul style="list-style-type: none"> • Exhaustive • Exhaustive with selective citation • Representative • Central or pivotal 	The coverage of this literature review will be of central or pivotal articles to create theoretical sensitivity around teacher professional development methods to create change.
Organization	<ul style="list-style-type: none"> • Historical • Conceptual • Methodological 	This literature review will be organized in a conceptual manner and reference key concepts regarding teacher professional development and teacher change.
Audience	<ul style="list-style-type: none"> • Specialized scholars • General scholars • Practitioners or policymakers • General public 	The audience for this literature review is a thesis committee made up of specialized scholars in the Centre for IT in Education (CRITE) at Trinity College Dublin.

This literature review will address the last two characteristics (Organization and Audience, see Table 1) of a thorough literature review by: 1) organizing it in a conceptual manner and referencing key concepts with regard to teacher professional development and teacher change; 2) writing the literature review for a specific audience that consists of thesis committee members at Trinity College Dublin. Explicitly stating one's position on these aspects of the literature review allows readers to understand the researcher's conclusions and relationship to the research phenomenon to be studied.

2.3. Literature Review of Teacher Change via Teacher Professional Development

The literature review that follows sets forth the US educational policy that drives and frames much of the discussion about teacher professional development in the current era of accountability. Based on the current educational policy focus on teacher professional development the literature review discusses the goals of teacher professional development and what the research indicates about its effectiveness. According to historical and current literature, the typical professional development workshop does not usually

meet the goal of changing teacher behavior that is the stated goal of teacher professional development.

Therefore, the literature review discusses a framework for teacher change, that this change is most effective when it is part of a system change, and the importance of leadership in system change. This leads into a discussion of reviews of the current literature that have identified features of effective professional development.

The conceptual similarity between features of effective professional development and communities of practice directed the literature review to communities of practice literature. Communities of practice are described and the features by which a community of practice is identified are provided. The connections between the identified features of effective teacher professional development and the features of a community of practice are compared. Lastly, analysis of the literature on communities of practice for teacher professional development is discussed.

Professional Learning Communities (PLCs) appeared in literature searches for both effective professional development and communities of practice. The literature review describes three types of PLCs and discusses PLCs as effective professional development.

Lastly, the literature review delves into current themes of the literature on PLCs. It summarizes the types of research that has been conducted on PLCs and identified a critical gap in the literature:

- What are the context and conditions within PLCs that create and sustain change in teacher practice?
- What role (if any) does situated learning, via communities of practice, play in creating the conditions that create and sustain change in teacher practice?

2.3.1. Educational Policy in the United States

Educational policy, in the United States, is constitutionally determined at the State level as opposed to the Federal level (Ladd, 2017). Initially, all educational policy was determined locally, by districts, and the State. While the Federal government passed the Elementary and Secondary Education Act

in 1965, it has been argued that the Federal government did not become a key player in American education until 1983. In 1983 the *Nation at Risk* report “helped create the perception that our schools were falling behind. (Heller, 2018)” This perception created a great deal of concern among Americans. That concern led to multiple groups (corporations, philanthropic think tanks, Congressmen, etc.) attempting to identify solutions that would bring the US Education system back to its perceived former glory.

Ultimately the conversation focused on improved standards and accountability (Heller, 2018; Jacob, 2017a; Ladd, 2017). The accountability issue led to the passing of the No Child Left Behind (NCLB) Act, in 2001, that reauthorized the Elementary and Secondary Education Act while significantly extending the role of the Federal government in education. NCLB was primarily concerned with enforcing the use of mandated curricula and testing, even though there was no empirical data to support either the curricula or the testing (Dennis, 2017). It achieved compliance by threatening to withhold funding.

Shortly after NCLB was introduced, the Gates Foundation (a philanthropic think tank) began working with the best standards currently in use as well as the experience of teachers, content experts, states, and leading thinkers to define improved learning standards (*Development Process | Common Core State Standards Initiative*, n.d.). The English and Math standards were published as Common Core State Standards in 2011, and in 2015, 42 States have adopted the standards. The Next Generation Science Standards were available for State adoption in 2013. These standard were created in coordination with twenty-six Lead State Partners and collaborated with critical partners, including the National Research Council, the National Science Teachers Association, and the American Association for the Advancement of Science (*Developing the Standards | Next Generation Science Standards*, n.d.).

Opinion about whether the research demonstrates any improvement in student results since NCLB is mixed (Jacob, 2017a; Ladd, 2017; Saultz et al., 2017). Some claim that there were statistically significant gains in 4th Grade Mathematics scores (while others point out that those gains were made within the first years of the program and were not likely a result of the changes required by NCLB) (Dee & Jacob, 2011; Jacob, 2017b; Ladd, 2017). In addition, while the policy provided a huge amount of data (from which

researchers have been able to increase our understanding) and increased the quality of teachers (by reducing the reliance on uncertified teachers) overall there were several unintended consequences of the law. One of the unintended consequences included the reduction of time spent teaching subjects such as social studies, art, and science, because mathematics and English language arts took up more time in the school day. Another, unintended consequence was that some States reduced their proficiency standards in order to appear to improve (Ladd, 2017).

Ladd (2017) shares Usher's 2015 report on annual yearly progress (AYP) results for 2010-11 that show that close to half of all schools were failing. In the midst of these results, the Federal government was easing some restrictions imposed by NCLB while staying focused on teacher accountability. The Obama administration, in 2009, introduced "the federal Race to the Top grant funding (RTT) to states implementing several teacher quality evaluation measures, including the use of standardized test scores. (Wright et al., 2018)" Again, there may be some unintended consequences with education reforms, such as Race to the Top, that focus on teacher evaluation systems which, in turn, may negatively impact teacher perceptions of their work environments (Curran & Kellogg, 2017; Ladd, 2017; Wright et al., 2018).

In 2015, Congress continued the Elementary and Secondary Education Act by eliminating NCLB and replacing it with the Every Student Succeeds Act (ESSA). The most significant change in ESSA is the return of education management to state control and, with this control, more flexibility around defining effective teaching and teachers as well as more flexibility with how schools and districts design and implement accountability structures. However, this flexibility is only available for schools that are deemed to be succeeding. The possibility exists, therefore, that underperforming schools will never get the chance to change the circumstances holding them back (Jacob, 2017a; Saultz et al., 2017; Williams & Welsh, 2017).

RTT and ESSA acknowledge that teachers should continuously improve their practice in order to be effective teachers (Dennis, 2017; Saultz et al., 2017; Wright et al., 2018). Schools and districts can define for themselves the criteria upon which to evaluate teachers as well as the methods by which they address the identified deficits. Within ESSA, there is quite a bit of flexibility (for performing schools, as previously indicated) to define teacher evaluation and professional learning environments.

Current US Educational Policy has created an environment where defining effective teaching is a high priority. The Every Student Succeeds Act provides federal funding for districts that are succeeding at improving student outcomes. This is driving the need to understand what makes for effective professional learning for teachers as well as identifying and implementing models that are proving effective.

2.3.2. Goals of Teacher Professional Development

Alongside the Federal requirements for effective teachers, researchers in education have been calling for a major reform in teaching practices in order to improve student achievements (Borko, 2004; Darling-Hammond & McLaughlin, 1995; W. R. Penuel et al., 2010; William R. Penuel et al., 2006). New standards (*Home | Common Core State Standards Initiative*, n.d.; *Next Generation Science Standards*, n.d.) and the need to incorporate technology in classrooms (Barlex, 2005; Button et al., 2002; Conole et al., 2008; Lawless & Pellegrino, 2007) are key pieces behind this reform movement. As a result teachers are being asked to teach in ways they have never taught and, possibly, never experienced as students (Darling-Hammond & McLaughlin, 1995). The current goal of teacher professional development, therefore, is to promote a whole-sale change in teacher practice so that educational systems achieve, on a wide scale, the kind of teaching that has considerable impact on student learning (Darling-Hammond et al., 2017; Dennis, 2017; R. C. Wei et al., 2010).

2.3.3. Professional Development Workshops

Cognitive learning theory has been the primary theory behind the design of professional development since the 1960s (Edwards, 2005; Greeno, 1997; J L, 2015; Lave, 1988). “Knowledge can be seen as schema or symbolic mental constructions. Learning is defined as change in a learner’s schemata.(J L, 2015)” This conception of learning leads to the professional development event that is conducted as a one-off, decontextualized transfer of information.

“It evokes images of what someone does to someone else; develop them. In education, professional development has, in fact, often been what someone does to others. The back-to-

school speaker holds forth in order to motivate the teaching staff for the coming year. The specialist arrives from the capital to increase teachers' knowledge of state standards. The university professor advances careers of educators through courses that offer credits to move them up on the salary scale. (Easton, 2008, p. 755)"

The professional development event (or workshop) is often deficit-focused and aims to fix some perceived failure in the teachers' methods (Clarke & Hollingsworth, 2002; Darling-Hammond & Richardson, 2009). Unfortunately, as Wei, Darling-Hammond, and Adamson report, U.S. "investments in teacher learning appear to be increasingly focused on the least effective models of professional development—short-term workshops that research suggests are unlikely to influence teaching practice and student. (R. C. Wei et al., 2010, p. 1)" This type of learning event considers only the cognitive approach to learning that says a generalized concept learned in one context is transferable to another context. Therefore, what a teacher learns in this event should change knowledge and beliefs and transfer directly to a change in her classroom.

The RTT teacher evaluation systems tend to support and drive this thinking in that the purpose of the evaluation is identify deficits in an individual teacher's pedagogy, content knowledge, and /or methods (Wright et al., 2018). On the other hand, ESSA provides schools more flexibility in choosing teacher evaluation methods and identifying accountability schemas. The research indicates that focusing on deficits and attempting to resolve them with decontextualized workshops is not effective (Darling-Hammond et al., 2017, Heck, Banilower, Weiss, & Rosenberg, 2008; Wilson & Berne, 1999). However, research on how teachers change their behaviors indicates that there are other ways to think about teacher professional development.

2.3.4. Framework for Teacher Change

Understanding what motivates teachers to change is critical in creating an effective professional development experience and environment (Clarke & Hollingsworth, 2002; Guskey, 1986, 2003; Tam, 2015). Guskey (1986) identified an assumed model (Figure 1: Assumed model of teacher change) for teacher change upon which most professional development is based. A

teacher attends a professional development event that changes that teacher's knowledge and beliefs that in turn changes her classroom practice that finally results in improved student learning outcomes.

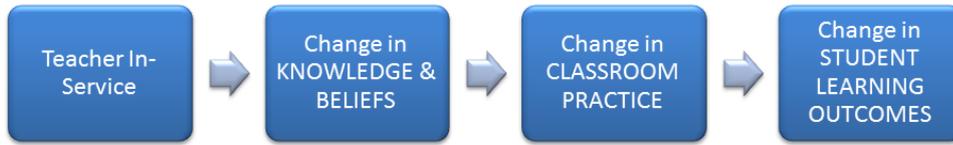


Figure 1: Assumed model of teacher change

Guskey's (1984, 1986) work indicates that, in fact, teachers' knowledge and beliefs do not change unless they see a positive change in student outcomes first. This means teachers must do some experimenting in their classrooms before they commit to the new knowledge and beliefs. Guskey's new model is shown in Figure 2: Guskey's (1986) model for teacher change.

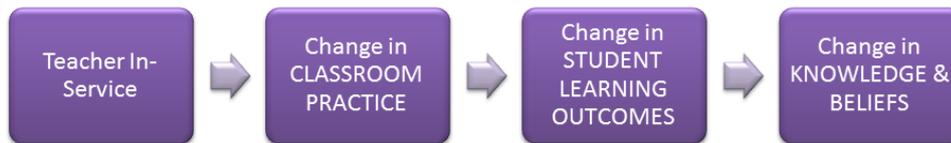


Figure 2: Guskey's (1986) model for teacher change

Clarke and Hollingsworth (2002) expanded on Guskey's model and created the Interconnected Model of Professional Growth (IMPG). Their research confirmed that teacher change is neither linear nor passively "received". The model they identified (Figure 3: The Interconnected Model of Professional Growth) includes all four factors of the other models (professional development event/external source, beliefs, classrooms, and outcomes). Additionally, their model includes enactment and reflection, because teachers are "active learners shaping their professional growth through reflective participation in professional development programs and in practice.(Clarke & Hollingsworth, 2002, p. 948)" Therefore, the Interconnected Model of Professional Growth indicates each facet of the change is made through mediating processes of enactment and/or reflection, and each domain can impact another directly instead of in a specific order.

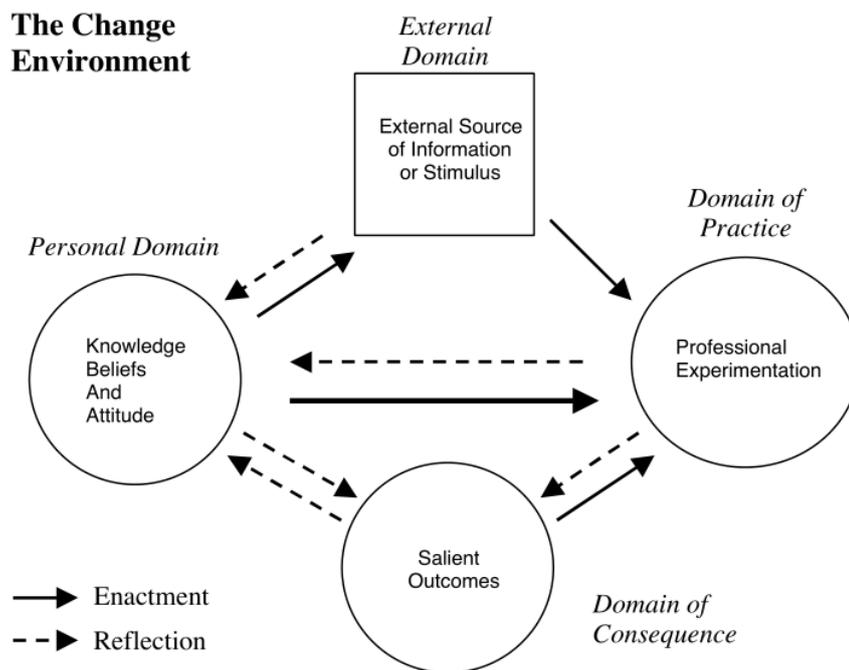


Figure 3: The Interconnected Model of Professional Growth

In The Interconnected Model of Professional Growth one sees the same elements that Guskey mentions, such as knowledge, beliefs, and attitude, outcomes, practice that occurs in a classroom, and external information. However, this model doesn't display them in a linear fashion. This model suggests that each of the elements can influence learning in various orders, depending on whether one is moving from one element to another via enactment or reflection.

Enactment and reflection are critical in creating change. Schön (1983) discussed the power of reflecting on one's professional actions and suggested, at the end of his book, that it was important for professionals to create "spaces" for collegial conversations and reflection in order to make explicit the implicit and to build new knowledge (Wieringa, 2011). This is a quite different epistemological stance from cognitive learning theory wherein one must only change one's knowledge and beliefs to build new knowledge.

Research has shown that deficit-focused workshops are not effective in changing teacher practice and that the change requires teachers to enact the potential changes and reflect on their effectiveness. While the reform that is needed in the United States cannot be done without changing teacher practice, teachers are only part of the reform equation. Schools, School Districts, and States must also change in order to affect the needed reform.

2.3.5. Leadership in System Change

In this current climate of reform, teachers are asked to change as part of an educational system. Leadership within the system is a key component to effective change (Fullan, 2005; Milbrey McLaughlin et al., 2003; Wahlstrom et al., 2010), and Principals play a key leadership role within the educational system. The nature of Principal leadership has been studied for several decades (Hallinger & Kovačević, 2019) and has undergone several changes in focus as a result.

Principals have long been in a key leadership position and this has meant their roles started changing some time ago. The early days of this change counted on the principal to provide instructional leadership to create reform in their school (J. Murphy et al., 2009; Supovitz et al., 2010). The principal needed to be the subject matter expert to direct coordination and supervision of the curriculum. While this approach worked well for elementary schools, the inability of the Principal to remain a subject matter expert made it much more difficult to achieve in middle and high school settings where the teachers frequently knew more about a subject than the Principal.

Current thinking and research suggests transformational leadership is a better way to achieve and sustain change (J. Murphy et al., 2009; Sebastian & Allensworth, 2012). In this environment, principals create a shared vision and commitment focused on innovation and spread the leadership of the change among teacher-leaders (Hallinger, 2003).

While all signs point to strong principals being important to creating and sustain change, research on managing change indicates that district support for the change is critical (Milbrey McLaughlin et al., 2003). Recent research indicates that district level employees understand the value they bring to changing their systems, but there are perceived barriers to accomplishing the change. "...the greatest perceived barriers are mainly external in nature and come from outside the district's control. The irony in this result is that those national requirements that are introduced to bring about reform are really perceived by superintendents as the barriers to bringing about the reform needed for student achievement. (Stewart et al., 2012, p. 8)"

The need for systemic leadership during change is confirmed in research by McLaughlin and Mitra (2001) who have identified five key features that are critical for leaders in supporting the change:

- Sufficient resources
- Knowledge of first principles
- Supportive community of practice
- Supportive principal
- Compatible district context

While the first two features address learning something new in order to change, the other three are clearly about strong leadership in a distributed leadership environment. The last feature speaks directly to the district's ability to get past perceived barriers. Without strong leadership at all levels, professional development for teachers, focused on change, is even less likely to be effective.

2.3.6. Effective Teacher Professional Development

The research indicates that the type of professional development provided as a one-time, short-term, deficit-focused event is not effective (Darling-Hammond et al., 2017; Darling-Hammond & Richardson, 2009; R. C. Wei et al., 2010). However, most teacher professional development is conducted based on the assumed model of change because learning to teach (and the training provided to change practices) is viewed from a cognitivist epistemology (Laura M. Desimone et al., 2002; Wilson & Berne, 1999). Viewing learning as a primarily cognitive function reinforces decisions to provide professional development as an event that is designed to change gaps in beliefs. In addition, research indicates that we cannot be sure of the effectiveness of these types of professional development because a clear understanding of what makes professional development effective has not been identified (Laura M. Desimone et al., 2002; Garet et al., 2001).

In 2009 two major studies were completed regarding what makes teacher professional development effective. The National Staff Development Council (R. Wei et al., 2009, pp. 9–11) sponsored a review of existing teacher professional development data that concluded that there are four principles for designing effective professional learning:

1. Professional development should be intensive, ongoing, and connected to practice;
2. Professional development should focus on student learning and address the teaching of specific curriculum content;
3. Professional development should align with school improvement priorities and goals;
4. Professional development should build strong working relationships among teachers.

Desimone (2009) conducted a review of the research literature and concluded that the following five features of effective professional development should provide the framework around which research should revolve:

- content focus
- active learning
- coherence
- duration
- collective participation

As can be seen in these two lists of professional development criteria, good professional development requires time to learn ('should be intensive, ongoing', and 'connected to practice' and 'duration'). These lists demonstrate that professional development needs to be focused ('specific curriculum content' and 'content focus') and collegial ('build strong working relationships' and 'collective participation'). Lastly, the lists demonstrate the need for context when learning ('connected to practice', 'aligned with school improvement priorities and goals' and 'active learning' and 'coherence'). Essentially, what makes professional development effective is learning that is driven by teacher practice around content, in a collegial environment, and within a continuous improvement model.

More recently, Darling-Hammond, Hylar, Gardner, and Espinoza (2017) conducted another meta-analysis of more recent literature. They reviewed "35 methodologically rigorous studies that have demonstrated a positive link between teacher professional development, teaching practices, and student outcomes.(Darling-Hammond et al., 2017, p. v)" The analysis revealed seven features of effective professional development:

- Content focused
- Incorporates active learning

- Supports collaboration
- Uses models of effective practice
- Provides coaching and expert support
- Offers feedback and reflection
- Is of sustained duration

This list extends and refines Desimone's work.

It is interesting to note that the more recent literature has expanded the list in important ways. For example, "active participation" has been replaced with features such as collaboration, feedback, and reflection to further refine expectations of learning design. Additionally, the feature "uses models of effective practice" defines the content of the learning design. These features of effective professional development have become the focus of research and are yielding key results that confirm their importance. However, these features are found to be somewhat lacking, because they are "not specific enough to guide professional development design decisions. (Osborne et al., 2019, p. 1076)"

2.3.7. Situated Learning and Communities of Practice

As a result of recent research (mentioned in the prior section) into what constitutes effective professional development, educational professionals are rethinking what it means to learn, especially what it means to learn in practice of the teaching profession (Darling-Hammond et al., 2017; Darling-Hammond & McLaughlin, 1995; Easton, 2008; Osborne et al., 2019; Putnam & Borko, 2000; Schlager & Fusco, 2003; Suzanne M. Wilson, 2013; Wayne et al., 2008).

"If we proceed without reflecting on our fundamental assumptions about the nature of learning, we run an increasing risk that our conceptions will have misleading ramifications.

(Etienne Wenger, 1998, p. 9)"

Leaders in professional development research are looking toward situated learning to potentially address concerns about the way professional development is approached (Borko, 2004; Borko et al., 2002; Cobb & Bowers, 1999; Glazer & Hannafin, 2006). While deficit-focused professional development may suggest that teachers working together in a workshop

creates context and community, situated learning theory argues that context and community are an inherent part of a teacher's professional community of practice thereby allowing time spent learning to be focused on the goal of the change (E. Wenger, 2004; Etienne Wenger, 1998). Situated learning and communities of practice recommend leaving the context and community to the teacher's professional community of practice (Richard DuFour, 2007; Etienne Wenger, 1998; Etienne Wenger et al., 2002).

Situated learning focuses on learning in a specific, authentic context with others doing the same work. The design for learning is accomplished through negotiation of the meaning of the practice that allows the community and its learners to work through four dualities: participation/reification; designed/emergent; local/global; and identification/negotiability (Etienne Wenger, 1998, p. 232). The learning trajectory is set by the community and helps the learner understand how to behave in that context and ultimately changes the way the learner views himself. By way of contrast, the cognitive model focuses on only the teacher and her behaviors separate from anyone else doing the same work. Learning is individualized and the design for learning is driven by remediating some perceived deficit. In the cognitive model, learning is seen as a process of inputs and outputs that allow the learner to absorb ideas. Table 2 summarizes the contrast.

Table 2: The new model of learning proposed in Lave and Wenger (Cox, 2005)

Cognitive Model	Constructivism/Situativism Model
Teaching	Learning
Classroom	In Situ
By teaching	By observation (therefore social) By peripheral participation
(Individualized) learns from expert	Learning from others (therefore social)
Planned in a curriculum	Informal, driven by the task (though elements of apprenticeship are formal)
Learning is a mechanistic, cerebral process of transmission and absorption of ideas	Learning is as much about understanding how to behave as what to do and is an identity change

Communities of practice is a concept first discussed by Lave and Wenger (1991) as they explored learning from an anthropological perspective in their seminal work "Situated Learning: Legitimate Peripheral Participation". Wenger (1998), Brown and Duguid (Brown & Duguid, 1991) and Wenger, McDermott, and Snyder (2002) extended the definition of communities of

practice as situated learning. Wenger et al., (2002) state that a community of practice is constructed of three key elements:

Domain – creates a common ground and a sense of common identity

Community – creates the social fabric for learning

Practice – provides the setting for learning through common frameworks, activities, language, etc.

The elements of a community of practice drive learning (and change) by creating coherence through mutual engagement within a jointly defined practice that allows community members to create a shared repertoire (Etienne Wenger, 1998).

The elements of effective professional development that Desimone (2009) identified and Darling-Hammond et al., (2017) confirmed and extended (Section 2.3.6) are closely related to the elements that make communities of practice successful (Etienne Wenger, 1998). Comparing the key elements of a situated learning community of practice with the key features of effective teacher professional development, as defined by Darling-Hammond et al. (2017) (Table 3), one sees specific relationships between the concepts. For example, the community of practice ‘domain’ for teachers is content focus, because it defines the common ground for learning. ‘Community’, in communities of practice, is a concept that suggests relationships over time and creates the social fabric for learning that allows for feedback and reflection as part of collaboration. The ‘practice’ of communities of practice provides the setting for learning through common frameworks and models, activities, and language that engage community members in learning. Together with community, they provide the context needed for a practice that can provide coaching and identify specific external support relevant to that community’s practice. These relationships suggest that communities of practice are effective professional development.

Table 3: Comparison of Community of Practice vs Effective Professional Development Features

Community of Practice Elements (Etienne Wenger et al., 2002)	Effective Professional Development Elements (Darling-Hammond et al., 2017)
Domain	Content Focus
Community	Sustained Duration Collaboration Feedback and Reflection

Practice	Active learning Use of Models and Modeling Coaching and Expert Support
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Situated learning is embodied in the concept of communities of practice. Cox (2005) reviewed four seminal works on communities of practice: Lave and Wenger (1991); Brown and Duguid (1991); Wenger (1998); and Wenger, McDermott, and Snyder (2002). The goal of the review was to discuss “different interpretations of the idea of ‘co-ordinating’ communities of practice as a management ideology of empowerment.(Cox, 2005, p. 527) The author indicates that the first three are quite similar, but have different central concerns while the fourth work “stands apart as a manual and inspirational text for practitioners on the formation of informal groups for learning in large companies.(2005, p. 536)” The author recommends that, when discussing a community of practice, one should position one’s use of the concept within one of the texts.

As the literature review is a context-setting element of a thesis, this literature review uses Wenger, McDermott, and Snyder (2002) as this version provides excellent definitions of the elements of a community of practice as it develops. In the theory and findings sections of this thesis, Wenger (1998) is used to explain the elements of the specific type of community of practice studied.

2.3.8. Critiques of Communities of Practice for Teacher Professional Development

While the current literature represents a positive conception of communities of practice for professional learning (Patton & Parker, 2017), there is research that has revealed issues with the concept when it comes to the ability of communities of practice to support teacher professional development. For example, Fuller, Hodkinson, Hodkinson, and Unwin (2005) compared Lave and Wenger’s (1991) concept of situated learning with an educational setting and a business apprenticeship setting. Their goal was to determine whether Lave and Wenger’s concept was able “to explain workplace learning in diverse contexts. (Fuller et al., 2005, p. 63)” Fuller et al. (2005) did find that both types of communities of practice (business apprenticeships and teacher communities of practice) in their study learned as a result of the social aspects of their communities of practice. However, the

authors were concerned that Lave and Wenger's concept did not address the impact on the community when experienced members joined a community and that legitimate peripheral participation cannot cover all workplace learning. These concerns should be considered as a researcher plans a study.

Additionally, the authors felt that Lave and Wenger were dismissive of the role of teaching in the process of learning; especially when it comes to traditional educational formats for learning. That is, the authors concluded that legitimate peripheral participation does not allow for one community member to teach another in a more formal manner. The authors state that Lave and Wenger oppose "the standard view of learning which was predominant at the time when they were writing.(Fuller et al., 2005, p. 66)" This could point to communities of practice being particularly inappropriate for supporting teacher professional development, because the format does not reinforce the primary purpose of professional development to improve teaching practice. However, other research has identified the benefits of communities of practice for supporting teacher professional development when the community is focused on its teaching discipline (Akerson et al., 2009; Nicole A. Bannister, 2018; Spalding & Wilson, 2006). This suggests that more research is needed into whether communities of practice support teacher professional development.

Lastly, Fuller et al. (2005) were concerned with the lack of acknowledgement about the significance of learner identity and the power struggles that occur within communities of practice. The context within which the community of practice is formed plays a role in the magnitude of the impact these aspects have on the community's health. The authors conclude by recommending further research to understand contexts and conditions of learning in communities of practice.

Other studies have further addressed issues of identity, participation, and the impact of external influences. Handley, Sturdy, Fincham, and Clark (2006) state that while the theoretical strength of the communities of practice concept may be accepted by many researchers, there are still gaps in understanding: 1) individual learning and identity transformation in communities of practice; 2) the wider, cultural settings that also impact communities of practice; and 3) the terms participation and practice, which (in Lave and Wenger (1991)) are sometimes interchangeable. The authors state that some limitations identified in Lave and Wenger (1991) were subsequently addressed and refined by Wenger (1998). As a result, Handley et al. (2006)

offer refined definitions for practice and participation that allow them to be operationalized in the specific context of communities of practice. These provide potential definitions for future research into communities of practice. The authors conclude with a call for research that “reflects the range of possibilities for individual participation within and beyond communities of practice.(Handley et al., 2006, p. 651)”

In an effort to understand more fully individual cognition within communities of practice, Edwards (2005) uses a series of research projects under the umbrella of the Teaching and Learning Research Program (TLRP) to discuss individual cognition. She chooses to frame community of practice and participation as metaphors based primarily on the work that Jean Lave has done with respect to understanding learning from an anthropological perspective. By treating the concept of communities of practice and its attendant concept of participation as a metaphor for learning through participation, the author is able to use it as a lens for examining cognition and how “people come to know and to act knowledgeably in different settings. (Edwards, 2005, p. 59)”

A key focus of Edwards’ research, therefore, is on assessing learning that is primarily socio-cultural (e.g., communities of practice) in nature. In the current era of reform being able to measure change is critical, but not many researchers are looking into measuring learning within communities of practice (Ropes, 2011). She suggests that such assessment might consider how the learner uses concepts to address new problems as opposed to whether the learner uses those concepts to resolve the curriculum-defined problem. In her final thoughts, Edwards recommends the need for a “theory of learning that will allow us to understand how we learn practices and ways of being that are new.(Edwards, 2005, p. 63)”

The current professional development literature indicates that there is value in situated learning theory and the concept of communities of practice to support teacher professional learning (Hirsh, 2009; Meijs et al., 2016; Putnam & Borko, 2000; Warren Little, 2002; Wilson & Berne, 1999). However, as the articles cited in this section advise, one must clearly specify the concepts that are part of situated learning theory when researching communities of practice. As Cox (2005) pointed out, each of the four seminal works on communities of practice have slightly different focuses which drive the definition of similar terms. Research into communities of practice needs to specify which version

of communities of practice the research is based on. Regardless, research into communities of practice should be aware of issues of identity, power, and the wider community that may impact on the communities under study.

2.3.9. Summary

Current US Educational Policy has set a reform agenda that centers on improved standards and educational accountability (Darling-Hammond & McLaughlin, 1995; Dennis, 2017). The Every Student Succeeds Act (ESSA) recommends this reform be driven by the upskilling of teachers. Control of the reforms is being returned to States to determine how to fund programs for professional learning that will improve student outcomes as well as how to measure the success of such programs (Curran & Kellogg, 2017; Saultz et al., 2017)

Existing literature states that one-off, deficit focused workshops, which are the key delivery method for professional learning, are not able to create the wholesale change that reformers are calling for. In addition, the current literature indicates that teachers are not able to produce the required level of change alone (Fullan, 2010; Fullan et al., 2004; Milbrey McLaughlin et al., 2003; Saultz et al., 2017). Districts must look at different methods for providing professional learning for teachers. Some of that change will include changing the support structures within schools and districts (Cobb et al., 2003; Fullan, 2005; Fullan & Knight, 2011).

Current literature indicates that situated learning may be the key to teacher professional learning that leads to change in practice (Borko, 2004; Putnam & Borko, 2000). Communities of practice are the primary format for situated learning and are proving an effective method for changing teacher pedagogical practices that impact student learning (Akerson et al., 2009; Nicole A. Bannister, 2018; Spalding & Wilson, 2006). More research is needed on the contexts and conditions that create these changes (Edwards, 2005; Handley et al., 2006; Osborne et al., 2019; Suzanne M. Wilson, 2013; Wayne et al., 2008) and demonstrate how and whether teachers learn (Edwards, 2005; McKellar et al., 2014; Verburg & Andriessen, 2006) in order to design better professional development.

2.3.10. Professional Learning Communities (PLCs)

The concept of Professional Learning Communities has been around since the mid-1970s and has grown through multiple iterations of ways to teach (e.g. the “thinking school”, the problem-based school, the Creative School, etc.). Professional Learning Communities (PLCs) were developed (primarily in the 1990s) using knowledge management and organizational learning theory (Richard DuFour et al., 2006; Hord, 1997). PLCs focus on the idea that teachers are at the center of improving their students’ outcomes, but that people inside and outside of schools are in a position to work together to have the most impact (Hord, 1997; Stoll et al., 2006). Stoll et. al., (2006, p. 225) state: “At the heart of the concept, however, is the notion of community. The focus is not just on individual teachers’ professional learning but of professional learning within a community context a community of learners, and the notion of collective learning.”

The literature frames PLCs as a specific type of learning organization developed to aid organizational knowledge management (Richard DuFour et al., 2006; Hord & Tobia, 2012; Stoll et al., 2006; Voulalas & Sharpe, 2005). A single approach to designing or developing a PLC has not been identified. Therefore, there is not a single definition of the membership that constitutes a PLC (Blankenship & Ruona, 2007; Gil et al., 2019). Blankenship and Ruona (2007) reviewed the literature on PLCs and divided them into three types:

- Professional Learning Communities – DuFour and Eaker (2007) brought this term into prominence and moved the concept to operationalization by defining specific activities that create the learning community.
- Whole-Faculty Study Groups – Murphy and Lick (C. U. Murphy & Lick, 1998) defined this process that brings all staff members together to learn so they are able to apply their new understanding to curriculum, assessment, and class room management.
- Creating Communities of Continuous Inquiry and Improvement – Hord’s (2004) goal is continuous improvement by building staff abilities in learning and change.

This demonstrates the variety of designs for Professional Learning Communities. All three types of PLC assume full faculty participation, but how

the groups or teams are formed varies. In addition, the reasons for learning collectively are not usually well-defined. Voulalas and Sharpe's (2005) research indicated "respondents lacked a clear understanding of a learning organization despite their actions to implement the concept in their own school.(2005, p. 187)"

Two of the three types of professional learning communities Blankenship and Ruona (2007) identify (Whole-Faculty Study Groups and Communities of Continuous Inquiry and Improvement) are based on the assumed model of teacher development as described by Guskey (see 2.3.6 Effective Teacher Professional Development). That is, that teachers will change their practice when their understanding changes. DuFour, Eaker, and Many's version of the PLC is based on teacher enactment and reflection changing teacher practice (see Figure 3: The Interconnected Model of Professional Growth).

The most operationalized form of a Professional Learning Community is described by DuFour, Eaker, and Many (Richard DuFour, 2015; Richard DuFour et al., 2006; Rick DuFour, 2003) who provide a step-by-step approach with clear guidelines and processes. What follows is a brief description of how this version of a PLC functions (see Figure 4: PLC Development per DuFour, Eaker, and Many (2006)).

As stated by Blankenship and Ruona (2007), within this style of PLC, everyone in a school or district participates in the PLC(s). The participation begins with understanding what it means to change their practice from a focus on teaching to a focus on student learning. To that end, everyone participates in the process of defining a vision and mission that will drive the change and the way members of the PLC will work going forward.

When everyone understands the vision and mission, the teachers break into teams by grade or subject. These teams may or may not function as individual PLCs. The practice that drives the activity of these teams is answering The Four Critical Questions.

1. What is it we want students to learn?
2. How will we know if students have learned it?
3. What will we do if students have not learned?
4. How will we deepen the learning for students who have already mastered essential knowledge and skill? (Hinman, 2006)

Each grade or subject team answers the questions by creating common pacing guides (to answer the question, “What is it we want students to learn?”) and common formative assessments (to answer the question, “How will we know if students have learned?”).

Simultaneous to the work of answering the first two questions is school- or district-wide PLC activity to prepare to answer questions three and four (“What will we do if students have not learned?” and “How will we deepen the learning for students who have already mastered essential knowledge and skill?”). Based on the mission to focus on student learning, addressing questions three and four usually require a systemic change within the school or district to provide time in the schedule to address the needs. This systemic change is then implemented across the grade/subject teams/PLCs so they are able to address student needs.

Putting these changes into practice is the final stage of becoming a functioning PLC. Again, one might consider the grade/subject-level teams as individual PLCs functioning within a broader, district-level PLC. However, all are invested in answering The Four Critical Questions to ensure student learning.

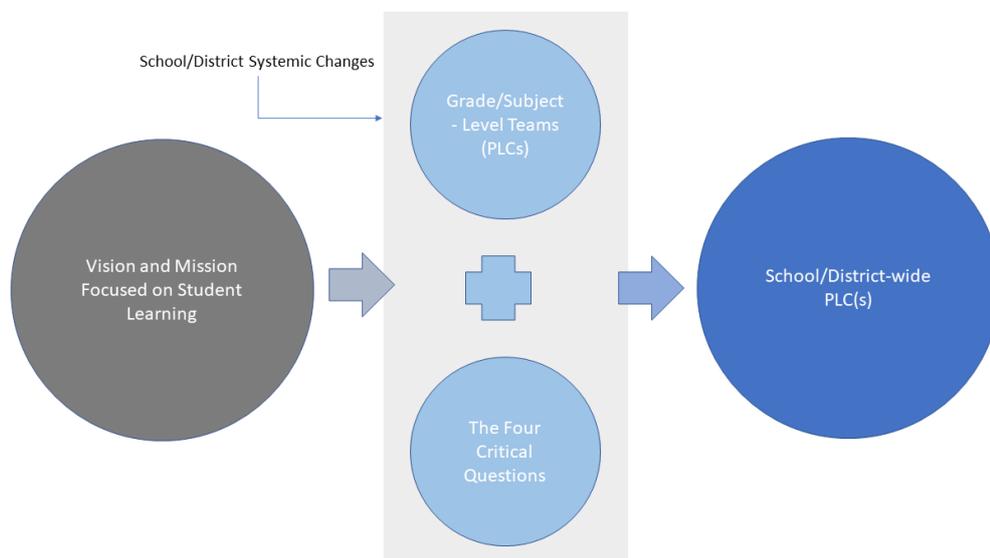


Figure 4: PLC Development per DuFour, Eaker, and Many (2006)

2.3.11. PLCs as professional development

The research is clear on the effectiveness of PLCs to change teacher practice in such a way as to increase student achievement (Saunders et al., 2009; Vescio et al., 2008; R. Wei et al., 2009; R. C. Wei et al., 2010). Wei, Darling-Hammond, Andree, Richardson, and Orphanos (R. Wei et al., 2009), as part of the School Redesign Network at Stanford University conducted studies that provided the basis for a state of professional learning report and a status report. These reports were based on research on effective professional learning that was conducted over several years and sponsored by the National Staff Development Council. These reports utilized longitudinal study data to determine what features of professional learning have the most impact on student learning. While their 2010 report does not name PLCs specifically, the description of the ideal system that seemed to have the highest degree of impact on student learning is the description of a Professional Learning Community.

The reports indicated that while peer coaching and mentoring have some effect, their methods are not always scalable nor are the results consistent. The only existing professional development method that empirically shows effect is prolonged time spent on a topic in collaboration with other teachers (R. C. Wei et al., 2010). Teachers see the benefit of getting out of their classroom silos and working together to resolve student achievement issues in their schools and districts (R. C. Wei et al., 2010). While presenting and explaining the National Staff Development's new definition for professional development, Stephanie Hirsh (Executive Director) said,

“Professional learning should wrap the expertise of educators in the school and at the district office, with support from universities and other external experts who help local educators address needs specific to their students and school improvement goals.(Hirsh, 2009, p. 10)”

Perhaps more important than what the School Redesign Network at Stanford University discovered was Vescio, Ross, and Adams (2008) review of the research available on the impact of PLCs on teaching practices and student learning. The review of PLC research demonstrated change in teaching practices and student learning. When looking at the results of the

studies about the impact of the PLC on student learning, the authors stated: “Although few in number, the collective results of these studies offer an unequivocal answer to the question about whether the literature supports the assumption that student learning increases when teachers participate in PLCs. The answer is a resounding and encouraging yes. (Vescio et al., 2008, p. 87)”

2.3.12. Current themes in PLC Research

Having outlined the theoretical source for Professional Learning Communities, described how one type of PLC functions, and discussed the research on PLCs as professional development, the literature review will conclude by discussing the key themes identified in literature as important to understanding and developing PLCs. The goal of this section is to identify specific gaps in the literature.

Two key themes emerged in a review of the literature:

- leadership in the effective formation and sustaining of PLCs (because leadership can either hinder or encourage change)
- features of effective learning organizations (because change happens as the result of a change in understanding).

These important areas of research assist in the operationalization of PLC creation and maintenance.

Much of the PLC literature involves aspects of leadership in creating and sustaining PLCs as explained by organizational learning and development theory (Darling-Hammond & Richardson, 2009; Richard DuFour, 2007; Richard DuFour et al., 2006; Fullan, 2005, 2009; Huffman, 2011; Jones & Thessin, 2015; Milbrey McLaughlin et al., 2003). Studies in this line of research focus on leadership of the change process, the role of principals, how to diffuse leadership among teachers, and the impacts of district leadership on the success or failure of PLCs in schools. Typically, these studies do not address the aspects of the PLC that change teacher practice.

The other major theme in PLC literature involves identifying and quantifying the key activities that create and sustain effective PLCs also defined by organizational learning and development theory (Hairon et al., 2013; Hord, 1997; Huffman, 2011; Louis & Kruse, 1995). Shirley Hord (1997)

identified five critical attributes of a successful PLC (supportive and shared leadership, collective learning and application, shared values and vision, supportive conditions, and shared personal practice). These have provided a great deal of the focus of existing research (Hipp et al., 2008; Huffman, 2011). While some studies seek to know how a specific attribute might change teacher practice, there were very few studies that sought to understand the processes that incorporated these attributes.

Recent literature reviews of PLC research identify the need to understand the conditions/contexts of creating PLCs and sustaining continuous improvement in a learning organization (Hairon et al., 2013; Jones & Thessin, 2015). Jones and Thessin (2015) examined the literature to understand the principal's role in the change process that moves teachers out of isolation and into collaboration. They used Fullan's (1985) three phases of change as a framework for discussing the results of the research. Their conclusion was that there needs to be more research specifically around sustaining PLCs and the ways in which principal leadership impacts the PLC. The focus of this literature review is on leadership, not a general understanding of PLC development.

Hairon, Goh, and Lin (2013) also discussed the need to understand leadership's role in creating and sustaining PLCs. The result of this article is a recommendation for research agendas that elucidate the specific causes, conditions, and contexts that create and sustain change and the aspects of leadership needed to drive the changes.

The result of these reviews demonstrates that the literature has at least three gaps regarding our understanding of PLCs:

- 1) What are the context and conditions **within PLCs** that create and sustain change in teacher practice?
- 2) What is the general process by which the PLCs create and sustain change?
- 3) What role (if any) does situated learning, via communities of practice, play in creating the conditions that create and sustain change in teacher practice?

2.3.13. Conclusion

In conclusion this literature review has demonstrated that US educational policy is driving the need in the US for effective teacher professional development in order to support a reform agenda. The literature review has discussed ineffective versus effective features of teacher professional development and that, as a result, educational leaders are calling for the use of situated learning as a component of teacher professional development that will impact positively on student learning.

The literature review has identified PLCs as potentially being a type of professional development that changes teacher practice insofar as research indicates that PLCs have demonstrated the ability to improve student learning. Although PLCs were developed based on knowledge management and learning organization theory, there is at least synergy between the DuFour, Eaker, and Many style of PLC and communities of practice. As a type of situated learning, communities of practice may have potential to support teacher professional learning that can drive the required educational reform to improve student learning outcomes.

Recent research has focused on the factors that create and sustain PLCs as well as the leadership needed to accomplish those tasks. While much of the literature calls for additional research that sets forth causes, contexts, and conditions, most of those calls are focused on leadership and how the factors of effective PLCs impact or play a part in leadership. The literature review identified no literature on the overall process of creating and sustaining effective PLCs nor did any of the research use the lens of situated learning to understand the process.

2.4. Purpose of Study

The purpose of this study was to understand the context and conditions within PLCs that create and sustain change in teacher practice and, from that understanding, create a theory of teacher change in practice with explanatory and predictive power.

From this, a framework for understanding the processes and structure of the change in teacher practice will emerge.

Chapter 3: Methodology

3.1. Introduction

There are many methodological choices available to a researcher. However, the choice of method is dependent upon the phenomenon under study and the questions the researcher is attempting to answer about that phenomenon (J. W. Creswell, 2009; Strauss & Corbin, 1998; Torraco, 2002). The purpose of this chapter is to provide the rationale for the chosen methodology (grounded theory), a description of the research approach, and a narrative of the researcher's application of the approach.

A thesis written for a hypothetico-deductive research study requires a description of the methods used in the study and a thorough description of the design of the study based on those methods (J. W. Creswell, 2009; Phillips & Pugh, 2005; Roy Suddaby, 2006). The circular and emergent nature of grounded theory makes it difficult to write such a linear progression of either the methodology or the specific research design (Luckerhoff & Guillemette, 2011). Suddaby (2006) highlights an issue with reporting a grounded theory approach in "the traditional discrete categories and in the same sequence as quantitative research: theory, data collection, data analysis, results (2006, p. 637)." He refers to the potential of 'methodological slurring' when grounded theory is presented in this way.

In an effort to avoid such slurring, the Research Design section (3.5) of this chapter will provide a narrative of the researcher's process based on the requirements and methods of grounded theory as opposed to a detailed description of the methods used. This approach to reporting the research design will also highlight the circular and emergent nature of the method that led to a substantive, mid-range theory that identifies the context and conditions in PLCs that create teacher change in practice that improves student performance. This chapter will cover:

- The rationale behind the methodology selection
- An overview of the methodology and some conflicts that have risen around it

- A review of the literature on issues inherent in using grounded theory
- A description of grounded theory research process
- A narrative account of the process the researcher used
- The role of theoretical sensitivity in the theory that emerged
- The researcher's reflections on using grounded theory
- A chapter summary

3.2. The research rationale and method

Research methodologies are chosen based on 1) the purpose or question the study is trying to address or answer, 2) the epistemology of the study subject and researcher, and 3) the specific contextual requirements of the study (Corbin & Strauss, 2008; J. Creswell, 2008; J. W. Creswell, 2013; J. W. Creswell et al., 2007; Savin-Baden & Major, 2013). This section presents the basis for the research focus and the purpose of the study, the epistemology of the study subject and researcher, the requirements for this study that impact choosing a methodology, and the analysis for deciding on Grounded Theory, based on those requirements.

3.2.1. Basis for research focus

The research was undertaken to develop a theoretical understanding of change in teacher practice as it is mediated using Professional Learning Community goals and activities. As identified in the Literature Review, the way teachers teach needs to change (Borko, 2004; Borko et al., 2009; Darling-Hammond & McLaughlin, 1995). The theories and methods we have been using to teach are no longer effective and new ways are being identified but implementation is lacking and teachers are not changing their practice (TNTP, 2015). There are a number of researchers identifying new theories and methods for professional development that leads to change in teacher practice, but whole system research is lacking (Laura M. Desimone et al., 2002).

Current research has identified the importance of situated learning features in professional development events (Darling-Hammond & McLaughlin, 1995; Laura M. Desimone, 2011; R. C. Wei et al., 2010).

However, the research is not able to show a change in teacher practice that impacts positively on student learning as a result of including these features in professional development events (Borko, 2004; R. Wei et al., 2009). Professional Learning Communities are similar to communities of practice and have demonstrated a change in teacher practice that impacts positively on student learning (Battersby & Verdi, 2015; Laura M. Desimone & Pak, 2017; Royer, 2012; Vescio et al., 2008; R. C. Wei et al., 2010).

PLC literature argues that creating a community of teacher-learners and changing focus from teaching and teachers to students and learning will enable the necessary changes (Richard DuFour et al., 2006). While much research has been done around best practices for starting and facilitating a PLC and even some research about the effectiveness of PLCs in improving student outcomes, there is little, if any, research around the relationship between professional development and teacher change in PLCs.

As there is other research and data about key development activities and demonstrating the effectiveness of PLCs in increasing student outcomes (Vescio et al., 2008), the researcher determined to understand the conditions and contexts within the PLC that bring about the change in teacher practices that positively impact student outcomes.

3.2.2. Phenomenon and study purpose

The purpose of this study was to understand the context and conditions within PLCs that create and sustain change in teacher practice and, from that understanding, create a theory of teacher change in practice with explanatory and predictive power.

From this, a framework for understanding the processes and structure of the change in teacher practice will emerge.

3.2.3. Personal Epistemology

As Reis (2004) states, one must be conscious of and specific about one's beliefs about knowledge, how it is acquired, and how it is analyzed, because one cannot assume that others share the same philosophical approach. There are two main paradigms of thought that influence a

researcher's ontology (world view) and epistemology (knowledge construction): positivism and interpretivism. The positivist paradigm states that there is a single reality that can be discovered, regardless of the researcher's position within the research. The interpretivist view states that the researcher and reality are inseparable and that knowledge is constructed through lived experiences (Weber, 2004). Positivist epistemology states that knowledge is out there to be objectively identified while the interpretivist view, especially as described within social constructivism, states that knowledge is co-created by those participating in the activity (N. K. Denzin & Lincoln, 2011).

Social constructivist epistemology is primarily concerned with the co-creation of knowledge. It impacts research projects by encouraging the researcher to consider the actions and interactions of the research subjects as well as their interpretation of why they behave in a certain way. "We believe that a goodly portion of social phenomena consists of the meaning-making activities of groups and individuals around those phenomena. The meaning-making activities themselves are of central interest to social constructionists and constructivists simply because it is the meaning-making, sense-making, attributional activities that shape action (or inaction). (N. K. Denzin & Lincoln, 2011, p. 116)"

Since the study is about learning and learning specifically as it happens through situated learning in community collaboration within a PLC, it is important to also make explicit the epistemology of situated learning, which is that learning is socially constructed. That is, "learning happens in our lived experience of participation in the world (Etienne Wenger, 1998, p. 3)." It cannot be separated from the rest of our activities. In collaborative communities of learning, learning is accomplished in doing a specific practice whether that is coaching soccer, writing poetry, or teaching. It is the social aspect of making meaning out of the frameworks and perspectives applied to the doing that creates knowing.

The researcher's own epistemology has evolved to encompass the concept that learning is primarily socially constructed. For both her Bachelors in Elementary Education and her Masters in Instructional Design, behaviorism drove teaching theory and practice. However, while designing learning and training opportunities for a management and consulting firm, she was introduced to social learning theory through a workshop based on Cultivating Communities of Practice (Etienne Wenger et al., 2002). Since that time, she

McDonald, Barbara

has used social learning theory concepts to design learning for others and herself. While there are theories that address specific aspects of learning (e.g. cognitivism, behaviorism, etc.), they do not negate the theory that knowledge is socially constructed.

Therefore, since the researcher's epistemology is that knowledge is socially constructed, which is derived from an interpretivist paradigm, and this study seeks to understand teachers' learning that drives change in practice as it happens within a professional learning community that possesses communities of practice features, the epistemological perspective of the research methodology should recognize the social construction of learning.

3.2.4. Strategy Requirements

As mentioned above, every research study has requirements that drive the choice of methodology. These requirements are based on the goal of the research (theory verification or theory generation) and the epistemology of the research area and researcher. As the goal of the research is to generate a theory and the epistemology is social constructivism, the methodology needs to be able to support a primarily inductive research approach to generate the theory as well as to be participant-centered and based on the participants' context to explore the lived experiences of the participants.

All research is a balance between deductive and inductive processes (Gasson, 2004; Perry & Jensen, 2001). Deductive reasoning starts with a generality, like a hypothesis or a theory, and looks for ways to examine it to identify a specific, logical conclusion. Positivist research approaches use this 'scientific method' to test whether observations concerning the theory or hypothesis are true. They move from the general (theory) to the specific (observations). Inductive reasoning, on the other hand, moves from the specific to the general. That is the researcher makes many, specific observations that lead to a pattern upon which the researcher makes generalizations that lead to an explanatory theory (Bradford, 2015). This is usually considered an interpretivist approach to research, but some believe that Glaser's approach has a positivist element of the single reality to be discovered (Mills et al., 2006). This is discussed in more detail in Section 3.3.2 Three Variations of Grounded Theory. While all research contains

elements of deduction and induction, it is only a primarily inductive research approach that results in a theory with explanatory power.

As the stated research purpose is to understand PLCs as they currently function, as opposed to identifying deficits or confirming methods of improvement, the research methodology should generate a theory of the lived experiences of the participants. The methodology must allow the data gathering to happen in such a way that participants' lived experience of meaning making is explored deeply and allows for the participants to make the connections for action (or inaction). Additionally, the methodology analysis tools must assist in aiding the researcher in making sense of the context of the data gathered. In this case, the context is teachers in a professional learning community that seems to have features of a community of practice.

For this study, the following requirements for the methodology have been identified:

- Has an interpretivist ontology
- Has a social constructivist epistemology
- Results in a theory
- The theory is the result of a primarily inductive approach
- Places data gathering and analysis within the context of the study

3.2.5. Methodology Analysis

There are many methodologies and designs for completing a research study (J. W. Creswell, 2009; Lynham, 2002; Perry & Jensen, 2001; Phillips & Pugh, 2005). It is critical that the methodology (and its associated design) is able to address the research problem at hand (J. Creswell, 2008; Miller, 1999). As the purpose of the research under question is not to measure, relate, or identify variables, the research method should not be a quantitative one. This leaves the researcher with multiple qualitative methodologies to consider. As discussed above in Section 3.2.3, qualitative methods run the gamut along ontological and epistemological lines (N. K. Denzin & Lincoln, 2011; Savin-Baden & Major, 2013). There are several methodologies currently recommended for educational research. Action Research, Ethnography, Case Study, and Grounded Theory were considered with relation to this research project. They were compared (**Table 4: Methodology Analysis**) based on the four

requirements outlined above: 1) ontology; 2) epistemology; 3) induction vs deduction; 4) context; 5) theoretical results.

Table 4: Methodology Analysis

Qualitative Method	Ontology	Epistemology	Inductive vs. Deductive	Context	Result
Action Research	Interpretivist	Social Constructivist	Deductive	Individual or community changes	New insight
Ethnography	Interpretivist	Dependent upon the ontological paradigm of researcher	Inductive	Testing preparation or advocacy	A hypothesis ready for testing
Case Study	Interpretivist	Dependent upon the ontological paradigm of researcher	Deductive	People, groups, and systems in context	Confirmation or extension of existing theory
Grounded Theory	Interpretivist	Constructionism	Inductive	People, groups, and systems in context	A theory of process and structure

Participatory Action Research is a methodology that is well-used in educational research circles (J. Creswell, 2008; Herbert & Rainford, 2014). The epistemology of Participatory Action Research is that learning is socially constructed, and it is particularly useful for changing one’s own practice or environment (J. W. Creswell et al., 2007). The methodology requires the researcher to identify a practice that is not working well, identify a plan for improving it, implement the plan, and then analyze the results (Judah & Richardson, 2006). The researcher is at the center of the research. It is a primarily deductive methodology whose results then take the researcher into a new cycle of planning, implementing, and analyzing until the researcher has identified a successful practice (Whitehead & McNiff, 2006).

Ethnography involves the study of culture; Creswell (2008, p. 436) quotes LeCompte, Preissle, and Tesch when he describes culture as “everything having to do with human behavior and belief.” The epistemology of ethnography is dependent upon the ontological paradigm under which the researcher operates. Creswell (2005) has identified three main categories of Ethnography: 1) realist ethnography; 2) case study; 3) critical ethnography.

The researcher's ontology will guide the choice of the type of ethnography used. Case Study is discussed in more detail below. While Ethnography deals in the world of socially constructed meaning, realist ethnography is primarily a quantitative/positivist research methodology. It has defined procedures for ensuring the researcher is able to stand apart from the phenomenon being studied. According to LeCompte, "the tools of ethnography are designed for discovery prior to "testing" (2010, p. 2)." Critical ethnography is an attempt to address the issues of representation and legitimation that arose from the understanding that realist ethnography is rarely actually objective. In addition, critical ethnographies "are a type of ethnographic research in which the author is interested in advocating for the emancipation of groups marginalized in our society.(J. W. Creswell, 2005, p. 441)"

Case Study methodologies are used in positivist and interpretivist approaches to research (Torraco, 2002). The researcher's own ontology and epistemology determine the approach with which to implement a Case Study (J. W. Creswell et al., 2007; Rule & John, 2015). The epistemology of Case Study is that learning is dependent upon the researcher's paradigm. However, it is mostly used within the interpretivist paradigm and seen as socially constructed (Riege, 2003). The primary use of Case Study is to provide contextual data for an issue under study. A case must be bounded, and its goal is to provide detail around the lived experience of the case. While it is participant-centered, Case Study is not particularly useful for understanding the relationships or process between complex systems (Stake, 1995). The deductive nature of case study means the result of a case study is the confirmation of a hypothesis or the extension of an existing theory (Swanborn, 2010).

Grounded Theory's worldview is that knowledge is socially constructed. That is, to understand a social phenomenon, one must understand it from the point of view of the people involved (J. Creswell, 2008; Barney G. Glaser & Strauss, 1967). It is a primarily inductive methodology that identifies the participants' perceptions of their reality and context (Gasson, 2004; Barney G. Glaser & Strauss, 1967). By conceptualizing reported experiences and comparing those concepts to experiences in other, similar situations, the researcher makes sense of the study participants' reality. The result of a grounded theory study is a theory with explanatory power of

process and structure (Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1990).

3.2.5.1. Analysis Results – Grounded Theory

The result of the analysis concluded that Grounded Theory meets the above requirements by:

- Having a similar ontology and epistemology that allows for learning and knowing that is socially constructed (Corbin & Strauss, 2008; Barney G. Glaser & Strauss, 1967; Lave & Wenger, 1991; Etienne Wenger, 1998).
- Being a primarily inductive approach to research that has as its goal identifying a theory by gathering and analyzing data, inductively allowing concepts to emerge, and using deductive methods to confirm categories, concepts, and their properties thereby grounding the new theory in data.
- Seeking to understand the lived experiences of participants by primarily gathering data via interviews with and observations of participants
- Being context sensitive through interviews and observations focused on the participants' own situation and understanding the situation as it is (Corbin & Strauss, 2008; Barney G. Glaser & Strauss, 1967; Perry & Jensen, 2001).
- Being designed for sociological research and the discoverers saying its aim is generating theories of process and structure in social settings (Barney G. Glaser & Strauss, 1967).

3.3. The Grounded Theory Approach

Grounded theory emerged as a qualitative approach to research in the 1960s as researchers were coming to terms with the realism of positivist research and its appropriateness for social science research. Existing, positivist methodologies were geared toward testing hypotheses. New, interpretive methodologies were interested in rich description and ensuring the accurate representation of lived experiences. Grounded theory straddles both concepts of good research by stepping past the testing of grand theories and incorporating the lived experiences of the participants

through the constant comparison of data that generates substantive theories with explanatory and predictive power.

As Grounded Theory is not a typical approach to research, this section of the paper will:

- Provide an overview of the methodology;
- Discuss the three, key variations of the coding methodology;
- Identify the variation to be used and the rationale behind that choice;
- Detail the requirements of the chosen approach;
- Describe the design of the research using grounded theory.

3.3.1. Grounded Theory Overview

Grounded Theory is a research approach that starts with observations, identifies patterns, and generalizes those into a theory (about a phenomenon) with explanatory power. The observations arise from cycles of simultaneous data gathering and analysis wherein conceptual patterns emerge that begin to form the emerging theory. As the researcher analyzes the data and emerging patterns, she can identify gaps in understanding and raise questions to be answered. A grounded theorist uses theoretical sampling to fill the gaps and answer the questions. Theoretical sampling allows the researcher to identify sources of data that meet the needs of filling out the patterns and generalizations that lead to an emerging theory. The new data adds to the specificity of the properties of the concepts (also called categories) as well as provides dimensional ranges within which the concepts operate. These additional cycles of data gathering and analysis lead to the identification of a category that allows the other concepts to expand and explain the key category thereby creating a theory with explanatory power.

Grounded theory uses a primarily inductive approach to research. The goal of grounded theory is to develop a theory that has explanatory and predictive power through the constant comparison of data. That is, the theory is grounded in data and decisions about data collection are driven by theoretical sampling. Theoretical sampling allows the researcher to identify data sources based on the needs of the emerging theory to provide variation in the data thereby clarifying concepts and their properties and dimensions.

As a result of starting with data and ending with theory, Grounded Theory approaches to research use both quantitative and qualitative methods to complete the research study (Corbin & Strauss, 2008). The key elements of grounded theory as they relate to the scientific process are the treatment of the literature review, the constant comparative method of data analysis, theoretical sampling for data gathering, and the construction and confirmation of a theory (Kelle, 2005; Luckerhoff & Guillemette, 2011).

There are two pieces of the methodology that make it unique and drive the need for different methods:

- “Theory is based upon patterns found in empirical data, not from inferences, prejudices, or the association of ideas.”
- “There is constant comparison between emergent theory (codes and constructs) and new data. Constant comparison confirms that theoretical constructs are found across and between data samples driving the collection of additional data until the researcher feels that “theoretical saturation” (the point of diminishing returns from any new analysis) has been reached. (Gasson, 2004, p. 80)”

The next section discusses the three main Grounded Theory approaches used in recent research (Classical, Straussian, and Constructivist) and concludes by identifying the chosen approach.

3.3.2. Three Variations of Grounded Theory

Grounded theory was first described by Barney Glaser and Anselm Strauss in their seminal work, “The Discovery of Grounded Theory.(Barney G. Glaser & Strauss, 1967)” Shortly after they documented the initial tenets of the approach, Strauss began working with Juliette Corbin. They generated theories using grounded theory as well as wrote a book about how they used grounded theory (Strauss & Corbin, 1990). Most recently, Kathy Charmaz has introduced the idea of constructivist grounded theory wherein the researcher positions herself with relation to the participants, data analysis, and representing participants’ experiences to create the grounded theory (Mills et al., 2006). Currently, there are three main variations of grounded theory used to generate theory. They are generally distinguished by these names: 1) Classical; 2) Straussian; 3) Constructivist.

3.3.2.1. Classical Grounded Theory

Classical grounded theory is generally attributed to Glaser after he and Strauss (1967) wrote “The Discovery of Grounded Theory.” Glaser insists on an unstructured analysis process wherein induction drives theoretical sampling and data analysis. The goal of the analysis is to label data with conceptual category names in order to abstract the data and identify patterns. Theoretical sampling allows the researcher to fill in the pattern gaps by seeking out more data that would answer the questions generated by the gaps.

Concerned with “forcing” data into pre-existing theories, Glaser also teaches that analysis of the literature should not be undertaken prior to data gathering beginning. Glaser has clarified concepts such as theoretical sensitivity, coding, and emergence in writings subsequent to “The Discovery of Grounded Theory” (Barney G. Glaser, 1978, 1998, 2002a). His primary concern is the methodological slurring that Suddaby (2006) writes is a possibility when one uses grounded theory in a mixed methods study or one is not clear about the difference between grounded theory and qualitative data analysis approaches (B. G. Glaser, 1999; Barney G. Glaser, 2002b, 2004; Barney G. Glaser & Holton, 2004).

3.3.2.2. Straussian Grounded Theory

Strauss worked with Corbin (2008; 1990, 1998) to create more structure (for the novice researcher) in the description of how to do grounded theory. Strauss and Corbin’s approach identified specific types of coding and analysis procedures that would help the beginning researcher move from one phase to the next. It is tempting for beginning researchers to get caught in endless cycles of data gathering and open coding and never move to identifying patterns and generalizations. By creating the concepts of Open, Axial, and Selective Coding, Strauss and Corbin created a framework that would help new researchers perceive what to do next.

While Strauss and Corbin see grounded theory as a self-contained methodology, their description of it lands somewhere on the qualitative research continuum. This can be seen in the title of their book, “Basics of Qualitative Research (Corbin & Strauss, 2008; Strauss & Corbin, 1990, 1998). As a result, their approach to grounded theory is not as strict as Classical

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grounded theory with regard to aspects such as the place of the literature review. Indeed, Strauss and Corbin identify a number of reasons to conduct a literature review prior to entering the field (Corbin & Strauss, 2008, p. 37)

Glaser's primary issue with Strauss and Corbin's version of grounded theory was the deductive nature of the coding paradigm Strauss and Corbin identified. In particular, Glaser views the Axial Coding process (identifying relationships between properties and dimensions) as introducing deduction too soon. Glaser felt that this pushed the methodology away from the inductive nature as Glaser and Strauss first described. This is discussed in more detail in Section 3.3.4 Glaser vs. Strauss and Corbin.

3.3.2.3. *Constructivist Grounded Theory*

The third version of Grounded Theory currently in wide use is Charmaz's Constructivist Grounded Theory. Constructivist Grounded Theory is driven from constructivist epistemologies that believe that 'reality' cannot be separated from knowledge of it (Savin-Baden & Major, 2013). Therefore, Constructivist Grounded Theory encourages the researcher to involve the participants more closely in meaning making and theory generation as the theory must reflect the reality that the participants perceive (Charmaz, 2014; N. K. Denzin & Lincoln, 2011). Glaser has railed against this version of grounded theory as merely a new twist on qualitative data analysis that is more appropriate for other qualitative methods than it is for theory generation (Barney G. Glaser, 2002b).

3.3.3. *Eliminating Constructivist Grounded Theory*

Mills, Bonner, and Francis (2006) conclude that the real difference between Classical, Straussian, and Constructivist grounded theory is an ontological difference. They state that, "Grounded theory can be seen as a methodological spiral that begins with Glaser and Strauss' original text and continues today (2006, p. 1)." Ontology is a theory about the nature of being or the kinds of things that have existence ("Ontology," n.d.). Realism and relativism are ontological positions. Positivism and interpretivism deal with epistemology (Fitzgerald & Howcroft, 1998). The assumption is that Classical Grounded Theory approaches Grounded Theory from realist ontology. The works of Straussian Grounded theory is the beginning of relativist ontology in McDonald, Barbara

Grounded Theory, and Constructivist Grounded Theory takes the methodology further along the spiral of relativist ontology.

However, Glaser insists that the difference between Classical and Constructivist Grounded Theory lay with the master one is trying to please. That is, one must decide whether one's explicit goal is accurate description (a Qualitative Data Analysis and Relativist requirement) or theory. Glaser states that Classical Grounded Theory is concerned with "transcending abstraction, not accurate description (Barney G. Glaser, 2002b)." As abstraction into theory is also this researcher's goal, and she has already identified her personal epistemology and that of her subject as being social constructionism, she determined not to use Constructivist Grounded Theory and will only compare and contrast Glaser with Strauss and Corbin and determine the approach between these two.

3.3.4. Glaser v. Strauss & Corbin

There are two, key differences within the methodology when comparing Glaser with Strauss and Corbin: 1) Coding and Analysis; 2) The place and purpose of the literature review. This section reviews those differences and provides a conclusion as to which is most appropriate for this study.

3.3.4.1. Difference #1 – Coding and Analysis

Since it is communicating the coding and analysis issue that must be wrestled with by the PhD student doing Grounded Theory, the structure for discussing the interpretive methods used is critical for clarity when presenting a thesis to a hypothetico-deductive committee (Luckerhoff & Guillemette, 2011). The comparison and contrast of this section will center on coding and analysis requirements of each approach.

As you can see in the diagram below (Figure 5), in Classical Grounded Theory data feeds the primarily inductive process until empirical generalizations occur. These generalizations are then compared against existing and new data until the empirical generalizations lead to a theory (Heath & Cowley, 2004). For the PhD student, it is difficult to provide structure in the writing of the process and results when induction is so predominant. It is

also more difficult for a novice researcher to be reflexive in her thought process when it is not clear whether she is being inductive or deductive in her decision making.

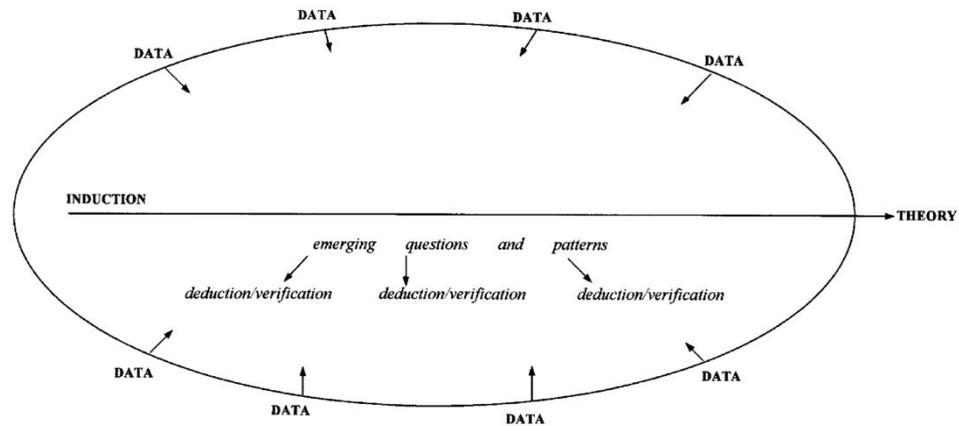


Figure 5: Glaser (1978, 1992) place of induction, deduction and verification in grounded theory analysis (Heath & Cowley, 2004).

Strauss and Corbin, on the other hand, are more defined about their use of deduction, induction, and emergence; letting the data speak for itself is the critical aspect of their process as well. To that end, Strauss and Corbin have identified three levels of coding specificity: 1) Open; 2) Axial; 3) Selective. Open coding allows the data to emerge through analysis and induction. Axial coding balances inductive and deductive strategies to begin making sense of the categories and properties as they are developing by inductively coding new data and deductively identifying categories and associations. Selective coding relies on deduction more as the researcher begins to see categories and properties define the emerging theory. The figure below (Figure 6) identifies the ebb and flow of induction and deduction through Strauss and Corbin's stages of coding and analysis.

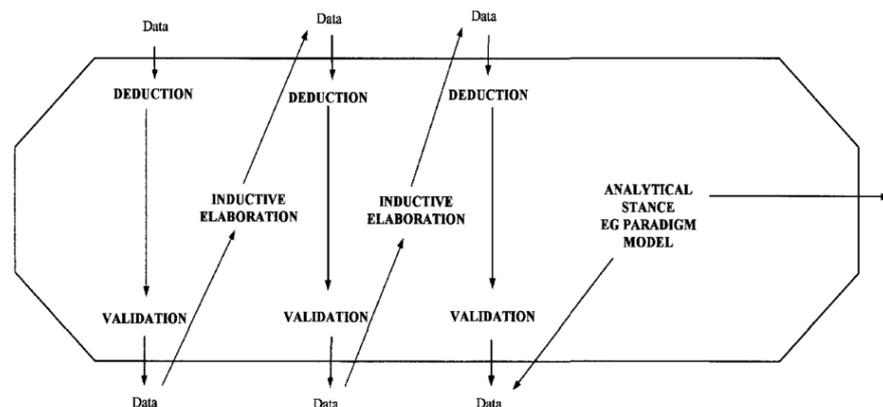


Figure 6: Strauss and Corbin (1998) induction, deduction, and validation in grounded theory analysis (Heath & Cowley, 2004).

Glaser's approach to coding, which focuses completely on induction, does not provide enough structure around which a PhD student can discuss the Grounded Theory research method of data collection and analysis (Hoare et al., 2012). Strauss and Corbin, on the other hand, provide a framework for the PhD student to codify the data and analysis and thereby discuss the research methods clearly and succinctly (Heath & Cowley, 2004; Luckerhoff & Guillemette, 2011). This research will be undertaken using Strauss and Corbin's framework for data analysis and theory generation.

3.3.4.2. Difference #2 - Literature Review

There is another aspect of the methodology that differs between Glaser and Strauss and Corbin and impacts the PhD student's presentation to a hypothetico-deductive committee – the role of the literature review (Luckerhoff & Guillemette, 2011). The standard format for a hypothetico-deductive thesis includes presenting a thorough review of the literature to demonstrate the researcher's command of the topic and to allow the researcher to identify the niche the resulting study will address (J. Creswell, 2008; Phillips & Pugh, 2005).

Glaser was adamant that no technical literature review be conducted prior to the beginning of the research as this introduced the opportunity for forcing data into the existing theories as opposed to allowing the theory to emerge on its own (B. G. Glaser, 1999; Barney G. Glaser & Strauss, 1967). He felt that any *a priori* knowledge could introduce the opportunity to force the data during the coding and analysis process. Glaser felt the only appropriate location of a review of the technical literature was "after the analytic core of categories has emerged" (Barney G. Glaser & Strauss, 1967).

While Strauss and Corbin agree that there is a danger of forcing the data when one spends too much time in a technical literature review prior to the beginning of the study, they are willing to concede that it may be impossible for a PhD student to avoid. They suggest that there may be several uses (e.g., stimulate questions for theoretical sampling, the secondary source of data, source of comparison at the dimensional level) for technical literature that span the life of the research study. They suggest that, for the

PhD student who must present a literature review, the literature review should be focused on enhancing the researcher's sensitivity to the study subject as well as prompting research questions to drive the initial interviews and observations (Corbin & Strauss, 2008).

3.3.4.3. *Reasons for Choosing Strauss and Corbin*

In order to meet the needs of traditional expectations for the flow and structure of a thesis as well as to provide more structure for this novice researcher, the researcher will use Straussian grounded theory – specifically the 2nd Edition Basics of Qualitative Research (1998). Specifically:

- Sensitizing literature review instead of a full review of the technical literature or an attempt to begin the research without any contextual grounding
- The process of open, axial, and selective coding to distinguish between specific types of analysis when writing up the process used

3.4. Grounded Theory and the Existing Literature

Any approach to research must also consider existing literature on the usefulness and applicability of the approach. Grounded theory, as a methodology, proposes to generate theory from empirical data (J. W. Creswell et al., 2007; N. K. (Ed) Denzin & Lincoln, 2000; Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998).

There are three major aspects of the methodology that make it difficult for researchers to understand (let alone do) the methodology. First, the ontological and epistemological stance of the methodology was shaken when the original authors took the methodology in different ontological and epistemological directions. The lines were blurred further with Kathy Charmaz (2014) adding a constructivist/constructionist version of the methodology. There is some discussion about whether grounded theory actually creates theory (G. Thomas & James, 2006), and if so, what type of theory (Mjøset, 2005). These issues make it difficult for new researchers to discuss a theory developed using grounded theory.

Second, grounded theory methods (primarily constant comparison) are used in other qualitative research methodologies (Corbin & Strauss, 2008; Merriam, 2009; Tan, 2010) whose goal is not to produce theory. Much of the discussion about the methodology revolves around the methods and features of grounded theory (Fendt & Sachs, 2008; Kanger, 2016; McCreddie & Payne, 2010; Tan, 2010) and how researchers are meant to use them to arrive at a theory. This makes it difficult for researchers to conduct grounded theory.

Third, as researchers have noted, because grounded theory does not follow the tenets of hypothetico-deductive research processes, it is difficult to report the study in the format that is most commonly used and understood by those evaluating research (Gasson, 2004; Luckerhoff & Guillemette, 2011; Roy Suddaby, 2006). Therefore, the ontological and epistemological struggles with creating grounded theory, the issues around doing grounded theory, and the difficulty of reporting the study combine to make it difficult to evaluate grounded theory results.

3.4.1. Issues with Creating Theory

With regard to grounded theory's ability to create theory, Thomas and James (G. Thomas, 1997; G. Thomas & James, 2006) challenge the concept that theory is worth creating, and that grounded theory cannot be grounded in data, because it is too dependent upon the researcher's biases to be objective. This is where the blurring of the ontological and epistemological lines becomes an issue for someone doing grounded theory. Glaser's stance continues to be a positivist one in that he maintains that the elevation of the data to concepts ensures researcher's objectivity (Barney G. Glaser, 2016). Strauss and Corbin take a more middling road regarding the need for objectivity in grounded theory (Strauss & Corbin, 1998). Glaser (2016, p. 4) states the need for discovering the process of the grounded theory approach, "We put to rest the 100% focus on the verifying of grand theory which was all conjectured. We discovered that GT provided us with relevant predictions, explanations, interpretations and applications that fit." Even though other authors (N. K. Denzin & Lincoln, 2011; Savin-Baden & Major, 2013; G. Thomas & James, 2006) attribute Glaser's methods to positivist ontology, it is good to remember that grounded theory was discovered as an effort to get

away from positivism and its requirements for objectivity, reliability, and validity (Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998).

As such, Suddaby (2006) reminds us that the goal of a grounded theory is not a statement of truth about reality. The goal of a grounded theory is to identify patterns of relationships between people in a social setting and to help us understand how, for the people involved, the relationships and interactions create their reality. He (R. Suddaby, 2014) identified 4 ways that theory contributes to society:

1. Knowledge accumulation
2. Knowledge abstraction
3. Its ability to create new realities
4. Legitimate knowledge

Regardless of the position about the role of theory in science, Lynham (2002) recommended a general research process within which Grounded Theory, as outlined by Glaser and Strauss, fits quite well. This is detailed in Section 5.4.

Researchers using grounded theory should, therefore, feel confident that the result of their research is a substantive theory useful for understanding the social context and structure of the phenomena of the study (Gasson, 2004; Roy Suddaby, 2006). The theory is also a framework that aids in the theory development process by providing conceptual and operational elements ready for future refinement (Egan, 2002; Lynham, 2002; R. Suddaby, 2014).

3.4.2. Issues with Conducting Grounded Theory

Arriving at that theory is the other focus of the current literature. Those writing about grounded theory indicate that even choosing the methodology is fraught with confusion (Fendt & Sachs, 2008; Hunter et al., 2011; Tan, 2010). Each indicates that, once the decision to use grounded theory is made, understanding the options and how each meshes with one's own ontology, epistemology, and even cognitive requirements (Heath & Cowley, 2004) should be considered. Tan (2010) provides an excellent review of the issues as well as her own doctoral thesis process as an example of how to deal with some issues. The four issues Tan identifies are:

1. Methodology/method confusion.
2. The use of literature in GT study.

3. How to code and categorize?
4. What theory will emerge?

The first issue Tan identifies is the methodology/method confusion that revolves around the use of grounded theory methods to assist analysis of other types of qualitative research and calling the result a grounded theory (J. Lawrence & Tar, 2013; Roy Suddaby, 2006; Tan, 2010). Again, one must be clear about the purpose of one's study and the analysis options available. For this thesis, those details were outlined and analyzed in Section 3.2.

This paper addressed the second (use of the literature in GT study) and third (how to code and categorize) issues in Section 3.3.4 as part of the decision between Glaserian and Straussian grounded theory. Lo (2016) discusses integrating the literature review within a grounded theory study. However, choosing the process is the most critical part of the issue in the current literature. Some authors also discuss revisions and refinements to the coding and categorizing process (Kanger, 2016; McCreddie & Payne, 2010; Tan, 2010). While the key authors (Charmaz, 2014; Barney G. Glaser, 1998; Strauss & Corbin, 1998) of grounded theory all describe coding procedures in detail, as Strauss and Corbin (1998) remind us, this is to ensure that beginning grounded theorists understand the analytic process in detail in order to avoid applying the methods in a rote manner. Strauss and Corbin (1998, p. 46) state: "The idea is not rigid adherence to procedures but rather fluid and skillful application."

Tan's last concern revolved around the emergence of the resultant theory. She recommended novice researchers should work toward producing a substantive, rather than formal, theory. The novice researcher should follow the validation process recommended by the specific approach (this thesis documents the validation processes in Section 3.6). Additionally, the researcher should be aware that substantive theories draw attention to specifics of the environment and are, therefore, incomplete (Tan, 2010). This is supported by Lynham's (2002) general research process for developing theory.

In order to do grounded theory well, researchers should ensure they understand the methodology and its methods based on the version of grounded theory that best fits the study purpose as well as their own ontological and epistemological stances. Applying the methods of any of the

versions with creativity and theoretical sensitivity will ensure a substantive theory useful for understanding the context and structure of the phenomena of the study.

3.4.3. Issues Evaluating Grounded Theory

Ultimately, issues with evaluating grounded theory revolve around the researcher's ontological and epistemological stance and the ontology and epistemology ascribed to grounded theory by the reviewer. Gasson (2004) provides an excellent summary (Table 5: Gasson's (2004, p. 90) Quality And Rigor Related To The Stages Of A Theory-Building Research Life-Cycle) of how to evaluate four key issues of a grounded theory study using the interpretive world view upon which grounded theory is based.

The first issue, representativeness of findings, addresses the issue of objectivity within the study. Gasson recommends that a reviewer look at the confirmability of the study. That is, can the reviewer confirm that the conclusions drawn are based on the subjects and conditions of the study as opposed to the researcher?

In a positivist worldview, the research study should be able to be replicated and result in the same findings regardless of time, context, or researcher. The interpretive worldview recommends determining whether the researcher provides an audit trail that demonstrates consistency of the methods over time. This is particularly important for a grounded theory, because grounded theory methods are not meant to test a hypothesis. Therefore, replicating a study with an emergent design would be very difficult.

The rigor with which the method is applied is of concern in both worldviews. For a positivist, this requires the research to have internal validity. That is, statistically significant findings demonstrate relationships between conditions. However, since grounded theory is not interested in verification, one must look for internal consistency. Are the findings related to significant aspects of the research context and are they credible to those who participated in the study?

Lastly, a reviewer would need to understand how to evaluate the generalizability of the study. When evaluating positivist research results one looks for external validity. That is, in what other contexts can the results be

applied? Since the goal of grounded theory is a theory of a substantive area, one needs to determine whether the findings are transferable to other contexts thereby aiding in the development of further useful theories.

Table 5: Gasson's (2004, p. 90) Quality And Rigor Related To The Stages Of A Theory-Building Research Life-Cycle

Issue of Concern	Positivist Worldview	Interpretive Worldview
Representativeness of findings	Objectivity: findings are free from researcher bias.	Confirmability: conclusions depend on subjects and conditions of the study, rather than the researcher.
Reproducibility of findings	Reliability: the study findings can be replicated, independently of context, time or researcher.	Dependability/Auditability: the study process is consistent and reasonably stable over time and between researchers.
Rigor of method	Internal validity: a statistically significant relationship is established, to demonstrate that certain conditions are associated with other conditions, often by "triangulation" of findings.	Internal consistency: the research findings are credible and consistent, to the people we study and to our readers. For authenticity, our findings should be related to significant elements in the research context/situation.
Generalizability of findings	External validity: the researcher establishes a domain in which findings are generalizable.	Transferability: how far can the findings/conclusions be transferred to other contexts and how do they help to derive useful theories?

When doing grounded theory it is important to explicitly state when biases, theoretical serendipity, theoretical sensitivity, and influences of existing literature play a part in the analysis and emerging theory (Gasson, 2004; Strauss & Corbin, 1998; Roy Suddaby, 2006). Reflexivity is a key part of the process in order to create an audit trail that demonstrates the creation of credible and consistent concepts throughout the research process. Ultimately, the grounded theorist should expect to be evaluated based on interpretivist discourse.

3.4.4. Conclusion

The study reported in this thesis is informed by this review in the following ways:

- 1) The researcher has clearly identified her personal ontology and epistemology as well as the epistemology of the research phenomena. This informed the version of grounded theory chosen for the study.
- 2) The context of the study is specifically constrained in order to derive a substantive theory.
- 3) The researcher has demonstrated a clear understanding of both the methodology and the methods.
- 4) The research has reported in such a way as to provide an audit trail that reflexively demonstrates the research process and the creation of credible and consistent concepts throughout the research process.

3.5. Grounded Theory Process

3.5.1. Overview of Grounded Theory

Grounded theory starts with data and ends with a theory that has explanatory and predictive power. Gasson (2004) recommends including purposeful reflexivity in order to add to the rigor and auditability of the process (Figure 7: Reflexive Grounded Theory Process). The phenomenon and research questions at the heart of the study determine where the researcher will find data – most often in the form of interviews, observations, and (in today's online world) documentation. Coding of the data for conceptual meaning and the analysis thereof happen simultaneously. Theoretical sampling assists the researcher in resolving emergent understanding ultimately creating a rich set of categories with properties and dimensions that represent the phenomenon in some way. Thorough grounded theorists use code notes, theoretical notes, and operational notes to reflexively memo emerging insights through multiple rounds of theoretical sampling.

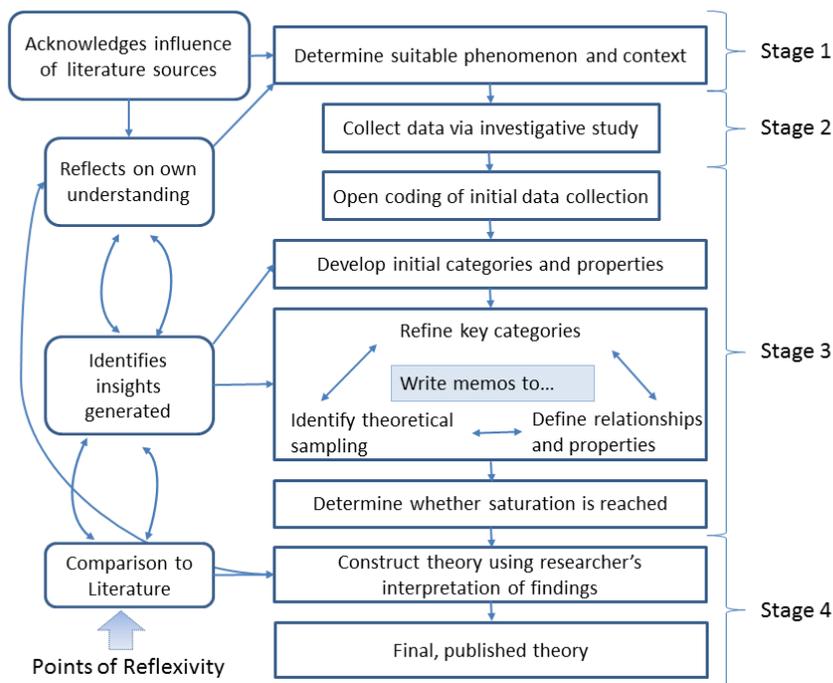


Figure 7: Reflexive Grounded Theory Process

Initial data collection and analysis (driven by the chosen phenomenon and one's acknowledgement of the influence of literature) results in a list of codes that are grouped into categories. Through constant comparison of categories, which represent groups of concepts, the researcher creates abstractions and then looks for the ways these categories, with their properties and dimensions, relate to one another. Gaps in understanding lead to further rounds of data gathering using theoretical sampling to direct the researcher to appropriate sources to gather data that meet the needs of the emerging theory. Once the researcher realizes that new data is not adding new information, she can consider that saturation has been reached and focus her attention on getting the theory to emerge.

Theory emerges when the relationships between the categories and subcategories (with their properties and dimensions) point to one key category under which the rest of the categories fit and provide explanation of the phenomenon. The researcher can write a theory using the concepts found within the categories that works and fits to explain the phenomenon of the study.

The following section will describe Strauss and Corbin's approach to Grounded Theory. This description is given as a linear process, but in order to achieve the main tenet of the approach – constant comparison of data – the

actual process (as detailed in Section 3.6) consisted of epicycles of the stages and methods described below. The stages of Grounded Theory are:

- Identifying the Phenomenon and Context
- Data Collection
- Analysis
- Theory Generation

3.5.2. Stage 1: Identifying the Phenomenon and Context

Determining the phenomenon under study can happen in several ways for a grounded theory approach. If one is working in a research department a supervisor might assign a phenomenon and questions to study. Strauss and Corbin (1998) suggest a light reading of the technical and non-technical literature to identify an area or phenomenon that has not been studied much or has been studied, but with conflicting results. This is a particularly useful approach for PhD students who have not had much exposure to research settings. They also suggest, “a researcher’s reading on a subject might suggest that a new approach is needed to solve an old problem, even though it has been well studied in the past (1998, p. 37).”

Once a researcher has identified a phenomenon to study, she must also identify the research questions that will drive the inquiry. The questions, the way they are phrased, and the way they relate to the phenomenon will drive the methodology used for the study. Grounded theory questions must be open and be an attempt to understand the phenomenon as opposed to test it. This ensures that the data gathering and analysis allow the theory to emerge rather than trying to force the data into pre-existing theories and concepts.

The phenomenon and research questions drive the context of the study and help the researcher identify a purpose statement to guide the study focus. Research questions for grounded theory tend to be broader than in quantitative research, because quantitative research questions need to be narrow enough to define a research approach that would test the hypothesis. Since grounded theory’s goal is new theory, the questions must bind the scope while leaving the researcher the opportunity to discover some new insight. The purpose and questions situate the research in a specific context.

3.5.3. Stage 2: Data Collection

Data collection techniques are not addressed explicitly in either Glaser and Strauss (1967) or Strauss and Corbin (1998). For both sets of authors data collection is discussed in relationship to theoretical sampling. Unlike hypothetico-deductive sampling in which the researcher gathers data via a sample of subjects that represent the general population (J. W. Creswell, 2009), grounded theory requires that the researcher obtains data through theoretical sampling of events and processes with the goal of gathering data that will be useful in comparing to other data and shed light on the phenomenon under investigation. Theoretical sampling is the idea of gathering data in order to fill out the emerging concepts and hypotheses through discovering variations of those concepts and hypotheses. The goal of theoretical sampling is to provide more data for comparison with existing data in order to add density to categories and their properties and dimensions. A grounded theory study usually uses accepted qualitative research data gathering techniques once theoretical sampling requirements have been defined.

3.5.3.1. Theoretical Sampling

In practice, the researcher identifies questions during the constant comparing of data as variations among concepts arise and relationships between concepts need clarification. These questions determine from whom to collect data and the type of data sought. The researcher identifies groups or sub-groups appropriate for the task and the theoretical purpose for the choices. (Barney G. Glaser & Holton, 2004) Once the researcher has located appropriate resources that answer the questions or address the gaps, the researcher should identify the following factors:

- The theoretical purpose of asking the question of this source
- Appropriate instrument(s) for gathering the data needed to answer the questions
- Logistics of accessing the sources

Pairing this analysis with the types of data collection instruments available determines the 'who' and 'how' of data collection in grounded theory.

3.5.3.2. Data Collection Instruments

There are multiple data collection instruments available within qualitative research methods. Creswell (2009) suggests there are four key types of qualitative data collection instruments.

- Observations
- Interviews
- Documents
- Audio-Visual Materials

Observations, in qualitative research, are those in which the researcher observes activities and makes notes of the observation. These notes can be unstructured – writing what is seen as it is seen – or semi-structured—writing what is seen in a predefined format that is usually designed to answer specific questions. Researchers engaged in observation may play roles ranging from non-participant to a complete participant (J. Creswell, 2008; Savin-Baden & Major, 2013).

When using interviews to obtain data, a researcher asks questions of participants that are designed to draw out the participants' experiences and opinions. The most commonly used question types in grounded theory are open ended and semi-structured interview questions. Open-ended interviews start with a goal in mind, but no specific path to reach that goal. Semi-structured interviews ask questions to ensure specific points are address. These questions may be asked in face-to-face interviews, telephone interviews, or focus groups (6-8 participants) (J. W. Creswell, 2009).

Documents and audio-visual materials are not used as often, but they are just as valid in answering questions as observations and interviews. Documents used in a qualitative study may include public or private documents. Public documents might be newspapers, white papers, or official reports. Private documents might be someone's journal, emails, or letters. Qualitative research also includes audio and visual materials as sources of data. This can be photographs, art objects, video, or any forms of sound. Should the researcher come across such material, it would be useful for transcription and coding.

Determining the best data gathering instrument is based on a combination of theoretical sampling and access to a source. That is, as the theory emerges and the researcher identifies questions of who, when, how

much, how often, and where, how to answer those questions is determined by the question itself and the logistics of finding a way to answer the question. Sometimes only an interview with someone can provide the answer while other times existing documentation about the topic can provide the information needed to answer the question.

3.5.4. Stage 3: Analysis

Strauss and Corbin (2008) identify three coding and analysis frameworks with which to discuss theory development: 1) Open Coding; 2) Axial Coding; 3) Selective Coding. Open coding involves working directly with the text to highlight phrases, sentences, or paragraphs and label the text with a concept. Axial coding involves working with the categories of codes that emerge from open coding and identifying relationships within and among the categories. Selective coding involves working with the category relationships to identify the theoretical scheme that drives theory generation from the data.

Open and axial Coding are grouped together because they form the initial data set from which the theory emerges. It is the interplay between open and axial coding as well as the researcher's need to return to these analysis tools during selective coding that make it difficult to report research process or results in a linear fashion. While Strauss and Corbin identify selective coding as an analytical tool, it is most often used in conjunction with identifying the theoretical scheme for the emerging theory. Therefore, it will be discussed in that context. It is the combination of open and axial coding that identifies the initial patterns in the data and aids in refining those patterns as the analysis continues.

The patterns identified and refined during open and axial coding allow the researcher to group codes into categories and identify sub-categories with properties and dimensions. Properties and dimensions are derived from the codes created in open coding and provide more depth of description to the category. Properties are codes that define the scope of the category while dimensions provide the range of behavior within which the properties operate.

Once the researcher has identified categories, sub-categories and the properties and dimensions of those subcategories, she begins to look more deeply for the relationships between the concepts that arose from the data

and the categories that were created. It is the relationships identified through axial coding that allow the researcher to begin Selective Coding to tease out the theory. Again, this is not a linear process and sometimes the researcher will collect new data to open and axial code and integrate into the emerging theory while in the Selective Coding and Theory Generation phase of Analysis. **Figure 8** below demonstrates the way the types of coding flow into one another.

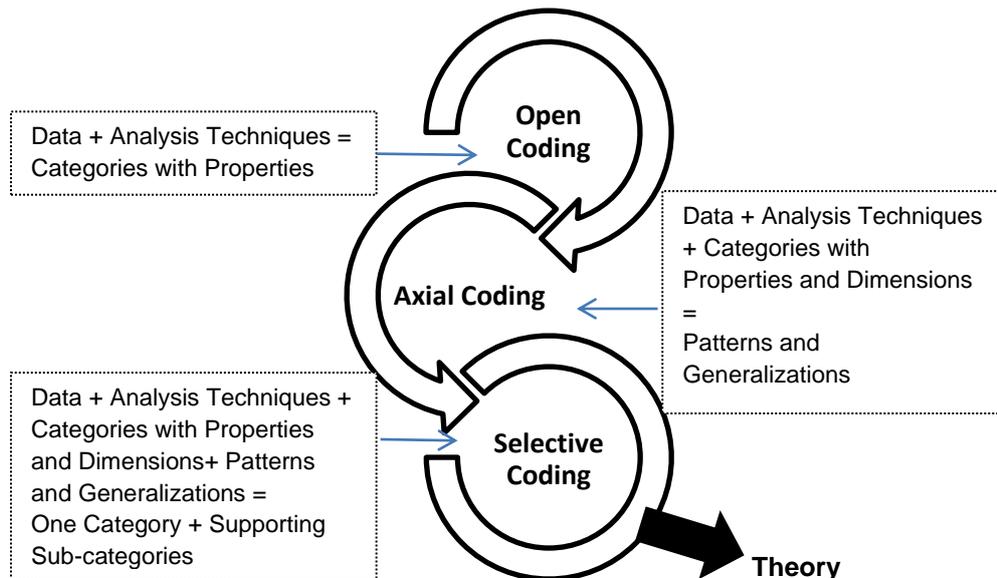


Figure 8: Strauss and Corbin Coding Process

3.5.4.1. Open Coding Stage

Open coding begins the initial analysis of data regardless of when (in the coding and analysis process) the data is obtained. Data is generally obtained via interviews with or observations of people experiencing or doing the phenomenon under investigation. Open coding is naming concepts in the data (e.g., snippets of the transcribed interviews and/or observation notes) as the researcher reads closely through the data. It is considered open coding, because the researcher creates codes that encapsulate a concept as she encounters data as opposed to creating a coding schema first and applying the codes to the data. Open coding is the process by which the researcher immerses herself in the data while it is closest to the lived experiences of the participants. This is an important part of the inductive process used in grounded theory as open coding is the first step in allowing the patterns and generalizations emerge from the data. The result of open coding is dozens of codes that represent concepts within the data. Along with coding of concepts,

there are several analysis techniques that a researcher may use while doing open coding.

Microanalysis is a technique wherein the researcher interrogates the data and emerging concepts by asking who, what, why, and when. Looking closely at single words, phrases, and sentences helps the researcher unpack the nuances of what is being said and helps determine, for example, whether two people who said essentially the same thing actually meant the same thing. It also helps determine whether that statement takes into account the same or a different context of experience. Microanalysis helps the researcher see patterns of relationships grounded in the data as they begin to emerge. The patterns allow the researcher to group the codes together into categories that represent high level generalizations. Each category has codes underneath it that identify subcategories of the concept while other codes represent the properties of the sub-category concept as well as dimensions of that property. New data is compared at the conceptual level to existing data to confirm or complete property and dimension patterns and generalizations.

Memo writing is a key analysis technique used during open coding. Memos are written records of analysis. Memo-writing is one way the researcher documents her own thinking process through each stage of the process. Memos are written as part of coding and should be written whenever the researcher considers something noteworthy or when it or other analysis techniques create questions. Strauss and Corbin (1998) state that there are three types of memos used in grounded theory: 1) Code Notes; 2) Theoretical Notes; 3) Operational Notes. Code notes are about specific codes and document the researcher's questions and thoughts about what codes mean. Theoretical notes consist of the connections and patterns the researcher identifies that may lead to a theory. Operational notes help track decisions made through the research process that lead the researcher to the emerging theory.

Diagrams are another analysis technique that is used throughout the open coding process. Diagrams provide the researcher with visual ways to make connections between concepts found in the data. Diagrams take many forms from word count maps to process flows to mind maps to Venn diagrams. These are examples of methods that enable the researcher to make connections and identify patterns.

Distinctions within and between the concepts are made through memo writing during open coding. Some of these are code memos while others are theoretical memos. These early memos are usually short and focused on making sense of the concepts and how they relate. During open coding, many occurrences prompt the researcher to write a memo. Examples of prompts are questions that arise during coding, patterns that emerge from diagrams, or early connections made in previous memos. A few operational notes are written at this time as well. These may be reminders of what to do next or comments about decisions made. Additionally, memo writing during open coding begins the reflexive process (sometimes through theoretical memos and sometimes through operational memos) that ensures the researcher's personal stance is accounted for during the analysis process. During Open Coding, the researcher's memos reflect the results of initial data analysis, emerging theoretical discoveries, and process decisions made as a result of the analysis and discoveries.

3.5.4.2. Axial Coding Stage

Axial Coding is the move from identifying concepts in the data to identifying the patterns and relationships within and among those concepts. It is the next level of abstraction of the data. During axial coding a researcher's theoretical sensitivity begins to play a larger part in the analysis process, because it is a researcher's theoretical sensitivity that makes the connections and sees the patterns that, in turn, drive more data gathering. This is also where Glaser's primary issue lay with regard to Strauss and Corbin's coding framework. Strauss and Corbin suggest that the research consciously begins to move between induction and deduction at this stage. That is, the researcher should make a point to validate hypotheses via theoretical sampling. Glaser maintains that this type of conscious effort at validation is not appropriate and that the flow from open coding to theory be driven much more inductively. Glaser wants to keep the focus of data collection throughout the process on broadening variations in the data in order to create easily understood properties and dimensional ranges. Whether or not a researcher is able to consciously move between induction and deduction, she will continue to use micro-analysis, diagrams, and memos (code memos, theoretical memos, and operational memos) to aid the analysis process.

Microanalysis plays a smaller part in axial coding, but it is always a part of making decisions about categories, properties, and dimensions and their relationships. That is, when identifying major categories of the data, a researcher asks herself who, what, when, and how a code (representing a concept) relates to the category in order to make decisions about where to place it. Likewise, as properties and dimensions are identified and related, determining who, what, when, and how those relationships work is critical in articulating the emerging theory.

Diagrams help a researcher identify sub-categories and their properties and dimensions. Being able to connect and reconnect concepts with properties and dimensions begins the process of building the theory. Diagrams play a larger part in axial coding as the researcher attempts to identify these patterns and relationships. A researcher might use a diagram, along with microanalysis, to determine what is missing in the data. Laying out a visual representation of the relationships and patterns makes gaps quite obvious and can help identify the theoretical purpose for theoretical sampling.

Memos are used through all of this to document thoughts and results. The researcher uses code memos (about specific concepts), theoretical memos (about the emerging relationships and the researcher's thoughts about those patterns), and operational memos (about decisions made, process lessons learned, and what needs to happen next) to struggle with the conceptual patterns. It is by tying the concepts and relationships together in memos that the researcher can eventually describe the categories by sub-categories with their properties and dimensions as the final output of the axial coding stage. Delving into the discoveries and patterns identified in memos helps the researcher see the relationships of the concepts within categories and between categories. This provides depth and range of variability to the emerging theory.

There are several results of Open and Axial coding. Open coding results in a list of codes and categories. These are used to identify patterns and relationships that create categories and sub-categories of codes. Axial coding results in the identification of properties and dimensions of the categories and sub-categories. It also results in the researcher identifying and understanding the relationships within and among these patterns of categories. Strauss and Corbin (1998) talk about these relationships in terms of The Paradigm. The Paradigm (Figure 9: Strauss and Corbin's Analysis)

Paradigm) appears in their discussion of Axial Coding and assists the researcher to think about their data in terms of process. That is, what happens that enables or causes action or interactions within the subjects that leads to a consequence. And what sort of data provides context for or influences those actions and interactions. One way to visualize The Paradigm is demonstrated below.

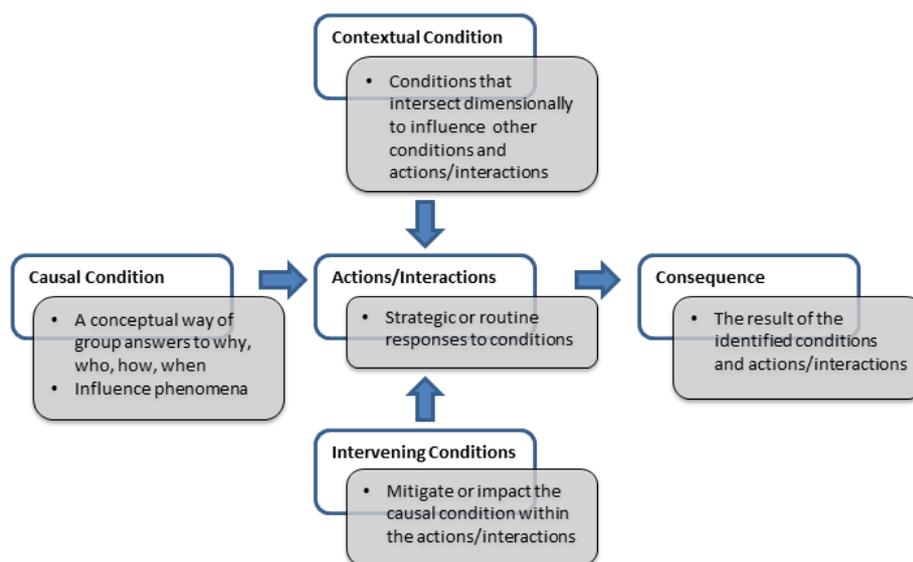


Figure 9: Strauss and Corbin's Analysis Paradigm

Theoretical sensitivity between the researcher and her data is possibly the most important result of open and axial coding. Without the theoretical sensitivity developed during these rounds of coding, the researcher is not able to develop the insight in order to move to theory generation.

3.5.5. Stage 4: Theory Generation

Glaser and Strauss (1967) developed the grounded theory methodology primarily to assist theory generation in sociological research that was not particularly suited to the theory verification of positivist research methods that dominated research in the 1960s. Theory, according to Strauss and Corbin (1998, p. 15), is “a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena.” While grounded theory can be presented as a “well-codified set of propositions, (Strauss & Corbin, 1998, p. 31),” Glaser and Strauss and Strauss and Corbin prefer to present a grounded theory as an ongoing conversation between concepts and their

relationships to each other. Selective coding is the first step in generating a theory from the conversation the researcher has been having with the data during open and axial coding.

3.5.5.1. *Selective Coding Stage*

Selective coding begins as theoretical saturation is being reached. The researcher is realizing that new data is not adding to the depth and range of variability and begins the process of integrating and refining the theory. It is possible, during selective coding, for the researcher to identify gaps or incomplete ranges and need to add more data, but for the most part the goal of selective coding is a theory: a set of relational statements about the study phenomena's process that is relevant for those involved (Backman & Kyngäs, 1999).

The theory consists of a set of interrelated concepts that are explained through the properties of the concepts as well as their dimensional ranges. The selection, in selective coding, occurs when the researcher, aware of the various relationships within and among the key categories selects a central category around which the key categories can be understood as a whole. Strauss and Corbin consider it a process of the researcher interacting with the data. "Brought into that interaction is the analytic gestalt, which includes not only who the analyst is but also the evolution of thinking that occurs over time through immersion in the data and the cumulative body of findings that have been recorded in memos and diagrams.(Strauss & Corbin, 1998, p. 144)" It takes the researcher recognizing the connections that form the relationships for the theory to emerge.

Most often, the emerging theory begins with one of the key categories rising to the level of central category as the relationships identified during axial coding point to it as being the source or center of the relationships with the rest of the key categories. However, it is not always so direct and sometimes it seems that two categories could be the central category or perhaps there's another concept that was not specifically found in the data, but which encapsulates the relationships. In these cases, the researcher must continue to interact with the data and the relationships to either pick between two key categories or identify a new concept altogether. Strauss and Corbin identify a couple of ways to accomplish this analysis: writing the storyline and reviewing

memos and diagrams. Frequently, this is done in cycles of writing and reviewing and sometimes writing more memos and creating more diagrams.

Writing the storyline begins with the potential central category and The Paradigm. Using The Paradigm, the researcher uses the sub-categories, properties, and dimensional ranges to describe the categories and the relationships within the category that exist between the sub-categories, properties, and dimensions. This leads to making the relational statements that explain the connections between the central category and the key categories as well as those connections between key categories. If the researcher is unable to make coherent sense or finds major gaps in the connections, she might realize that there is something wrong in how she is interacting with the data. This is when she might return to her data, memos, and diagrams to create more memos and diagrams in order to rethink the connections.

Memos and diagrams are usually arranged by category and, if the researcher has access to software for memo writing she might have made physical connections between the memos to also document her thought process as the data became more abstract and the relationships denser. Through the review, she might come across a connection made early on that wasn't explored in more depth immediately, but that potentially holds the key now. Any number of the interactions the researcher continues to have with her data could be the key that unlocks the clues to an abstract theoretical scheme that explains all of the data (Strauss & Corbin, 1998, p. 155).

3.5.5.2. *Emerging Theory*

Glaser, Strauss, Corbin, and most other authors writing on the grounded theory approach provide little detail about how to generate theory. Getting the theory to emerge is dependent on the researcher's theoretical sensitivity, the phenomenon, and the data collected. What triggers the researcher's final theoretical scheme can be inspired by theoretical sensitivity or it can be directly from the data as a central category actually emerges (Barney G. Glaser & Strauss, 1967). Since the theory itself should be written as a 'running theoretical discussion' or narrative, the most efficient way for generating the theory is writing the storyline, which is an analytic tool that Strauss and Corbin recommend.

Sometimes the connections between each of the categories explain part of the whole, but are not able to tie the rest together. “A novice researcher may find it difficult to look for a core variable when coding his/her data, because switching one’s focus from studying a unit to studying a process is painful. It takes time and much coding and analysis to verify a core category through saturation, relevance and workability.(Backman & Kyngäs, 1999, p. 151)” This is where writing the storyline can be particularly useful as it forces the analyst to think through the processes that are at work within the data and relationships. Eventually, the researcher is able to identify that theoretical scheme and write the storyline of the theory. She can then weave the relational statements together with the properties and dimensional ranges to create a theory of the lived experiences of the study participants that fits and works. Ultimately, it is the ability of the theory to explain the phenomenon through the relationships between the properties and their dimensional ranges and the predictive power of those relationships that validates the theory with both the researcher and the study participants.

3.5.5.3. Refining the Theory

Once the story of the theoretical scheme has been written it is important to refine the theory by double-checking the internal consistency and logic of what has been written. Additionally, the researcher will want to continue selectively coding by choosing what stays and what might ultimately be irrelevant. Since the theory is based on data obtained from the lived experiences of the participants, it is good to get some feedback about what whether they believe what is written. The last way one should refine the theory is through building in variation to the theory.

Internal consistency and logic is achieved through a thorough reading and possibly diagramming of the theory. The goal is to make sure that there are no contradictions and that the overall theory fits and works. The researcher should return to her data – text and memos -- and make sure the concepts in the final theory are found within. Another way to check for internal consistency is by sharing a summary of the theory with a layperson. The process of explaining it checks for consistency as well as ensuring that the theory fits and works. Since grounded theory discovers theory about the lived experiences of the participants, consistency and logic also need to ensure that the theoretical scheme represents those participants.

Choosing what to include and what to leave out is the result of multiple iterations of writing the relational statements within the story. Does the data within add depth in understanding or does it repeat something that is better said elsewhere? Does the statement really support the theory or is it an interesting tangent? Is there a poorly developed category that needs to be filled out with more data to make the picture of the relationships clearer? These are some of the questions a researcher must ask herself when refining the theory.

Validating the theoretical scheme does not mean validation in the same way as hypothetico-deductive research means it. That is, even at this stage, one does not test the theory. Rather, validating, in grounded theory includes asking study participants to read the theory or a summary of the theory to make sure it authentically represents their experience. Because the theoretical scheme is arrived at through abstraction of many sources of data, it will not always represent exactly the participant's experience, but it must be possible in their world and make sense to them.

Building in variation means the researcher needs to ensure there are enough examples of the ranges of the properties as possible. While the research process ends when new data does not yield new insight or variation, the researcher should return to her data to see if there are memos or diagrams that suggest data that could add variation to the theoretical scheme, thereby providing substance to the theory.

3.6. Research Design

3.7. In a standard, hypothetico-deductive thesis, this section would outline the research design and explain how the researcher addressed the tenets of its methodology prior to testing. As a result of grounded theory's inductive and emergent approach to identifying a theory, the following narrative provides insight into the process the researcher used and examples of analysis within the various stages of the process. Making the process explicit and auditable increases the quality and rigor of the research (Gasson, 2004; Suddaby, 2006). Therefore, this section documents the four stages of developing a grounded theory as described in Section 3.5

Grounded Theory and the Existing Literature

Any approach to research must also consider existing literature on the usefulness and applicability of the approach. Grounded theory, as a methodology, proposes to generate theory from empirical data (J. W. Creswell et al., 2007; N. K. (Ed) Denzin & Lincoln, 2000; Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998).

There are three major aspects of the methodology that make it difficult for researchers to understand (let alone do) the methodology. First, the ontological and epistemological stance of the methodology was shaken when the original authors took the methodology in different ontological and epistemological directions. The lines were blurred further with Kathy Charmaz (2014) adding a constructivist/constructionist version of the methodology. There is some discussion about whether grounded theory actually creates

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theory (G. Thomas & James, 2006), and if so, what type of theory (Mjøset, 2005). These issues make it difficult for new researchers to discuss a theory developed using grounded theory.

Second, grounded theory methods (primarily constant comparison) are used in other qualitative research methodologies (Corbin & Strauss, 2008; Merriam, 2009; Tan, 2010) whose goal is not to produce theory. Much of the discussion about the methodology revolves around the methods and features of grounded theory (Fendt & Sachs, 2008; Kanger, 2016; McCreddie & Payne, 2010; Tan, 2010) and how researchers are meant to use them to arrive at a theory. This makes it difficult for researchers to conduct grounded theory.

Third, as researchers have noted, because grounded theory does not follow the tenets of hypothetico-deductive research processes, it is difficult to report the study in the format that is most commonly used and understood by those evaluating research (Gasson, 2004; Luckerhoff & Guillemette, 2011; Roy Suddaby, 2006). Therefore, the ontological and epistemological struggles with creating grounded theory, the issues around doing grounded theory, and the difficulty of reporting the study combine to make it difficult to evaluate grounded theory results.

3.7.1. Issues with Creating Theory

With regard to grounded theory's ability to create theory, Thomas and James (G. Thomas, 1997; G. Thomas & James, 2006) challenge the concept that theory is worth creating, and that grounded theory cannot be grounded in data, because it is too dependent upon the researcher's biases to be objective. This is where the blurring of the ontological and epistemological lines becomes an issue for someone doing grounded theory. Glaser's stance continues to be a positivist one in that he maintains that the elevation of the data to concepts ensures researcher's objectivity (Barney G. Glaser, 2016). Strauss and Corbin take a more middling road regarding the need for objectivity in grounded theory (Strauss & Corbin, 1998). Glaser (2016, p. 4) states the need for discovering the process of the grounded theory approach, "We put to rest the 100% focus on the verifying of grand theory which was all conjectured. We discovered that GT provided us with relevant predictions, explanations, interpretations and applications that fit." Even though other

authors (N. K. Denzin & Lincoln, 2011; Savin-Baden & Major, 2013; G. Thomas & James, 2006) attribute Glaser's methods to positivist ontology, it is good to remember that grounded theory was discovered as an effort to get away from positivism and its requirements for objectivity, reliability, and validity (Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998).

As such, Suddaby (2006) reminds us that the goal of a grounded theory is not a statement of truth about reality. The goal of a grounded theory is to identify patterns of relationships between people in a social setting and to help us understand how, for the people involved, the relationships and interactions create their reality. He (R. Suddaby, 2014) identified 4 ways that theory contributes to society:

5. Knowledge accumulation
6. Knowledge abstraction
7. Its ability to create new realities
8. Legitimate knowledge

Regardless of the position about the role of theory in science, Lynham (2002) recommended a general research process within which Grounded Theory, as outlined by Glaser and Strauss, fits quite well. This is detailed in Section 5.4.

Researchers using grounded theory should, therefore, feel confident that the result of their research is a substantive theory useful for understanding the social context and structure of the phenomena of the study (Gasson, 2004; Roy Suddaby, 2006). The theory is also a framework that aids in the theory development process by providing conceptual and operational elements ready for future refinement (Egan, 2002; Lynham, 2002; R. Suddaby, 2014).

3.7.2. Issues with Conducting Grounded Theory

Arriving at that theory is the other focus of the current literature. Those writing about grounded theory indicate that even choosing the methodology is fraught with confusion (Fendt & Sachs, 2008; Hunter et al., 2011; Tan, 2010). Each indicates that, once the decision to use grounded theory is made, understanding the options and how each meshes with one's own ontology, epistemology, and even cognitive requirements (Heath & Cowley, 2004) should be considered. Tan (2010) provides an excellent review of the issues

as well as her own doctoral thesis process as an example of how to deal with some issues. The four issues Tan identifies are:

5. Methodology/method confusion.
6. The use of literature in GT study.
7. How to code and categorize?
8. What theory will emerge?

The first issue Tan identifies is the methodology/method confusion that revolves around the use of grounded theory methods to assist analysis of other types of qualitative research and calling the result a grounded theory (J. Lawrence & Tar, 2013; Roy Suddaby, 2006; Tan, 2010). Again, one must be clear about the purpose of one's study and the analysis options available. For this thesis, those details were outlined and analyzed in Section 3.2.

This paper addressed the second (use of the literature in GT study) and third (how to code and categorize) issues in Section 3.3.4 as part of the decision between Glaserian and Straussian grounded theory. Lo (2016) discusses integrating the literature review within a grounded theory study. However, choosing the process is the most critical part of the issue in the current literature. Some authors also discuss revisions and refinements to the coding and categorizing process (Kanger, 2016; McCreddie & Payne, 2010; Tan, 2010). While the key authors (Charmaz, 2014; Barney G. Glaser, 1998; Strauss & Corbin, 1998) of grounded theory all describe coding procedures in detail, as Strauss and Corbin (1998) remind us, this is to ensure that beginning grounded theorists understand the analytic process in detail in order to avoid applying the methods in a rote manner. Strauss and Corbin (1998, p. 46) state: "The idea is not rigid adherence to procedures but rather fluid and skillful application."

Tan's last concern revolved around the emergence of the resultant theory. She recommended novice researchers should work toward producing a substantive, rather than formal, theory. The novice researcher should follow the validation process recommended by the specific approach (this thesis documents the validation processes in Section 3.6). Additionally, the researcher should be aware that substantive theories draw attention to specifics of the environment and are, therefore, incomplete (Tan, 2010). This is supported by Lynham's (2002) general research process for developing theory.

In order to do grounded theory well, researchers should ensure they understand the methodology and its methods based on the version of grounded theory that best fits the study purpose as well as their own ontological and epistemological stances. Applying the methods of any of the versions with creativity and theoretical sensitivity will ensure a substantive theory useful for understanding the context and structure of the phenomena of the study.

3.7.3. Issues Evaluating Grounded Theory

Ultimately, issues with evaluating grounded theory revolve around the researcher's ontological and epistemological stance and the ontology and epistemology ascribed to grounded theory by the reviewer. Gasson (2004) provides an excellent summary (Table 5: Gasson's (2004, p. 90) Quality And Rigor Related To The Stages Of A Theory-Building Research Life-Cycle) of how to evaluate four key issues of a grounded theory study using the interpretive world view upon which grounded theory is based.

The first issue, representativeness of findings, addresses the issue of objectivity within the study. Gasson recommends that a reviewer look at the confirmability of the study. That is, can the reviewer confirm that the conclusions drawn are based on the subjects and conditions of the study as opposed to the researcher?

In a positivist worldview, the research study should be able to be replicated and result in the same findings regardless of time, context, or researcher. The interpretive worldview recommends determining whether the researcher provides an audit trail that demonstrates consistency of the methods over time. This is particularly important for a grounded theory, because grounded theory methods are not meant to test a hypothesis. Therefore, replicating a study with an emergent design would be very difficult.

The rigor with which the method is applied is of concern in both worldviews. For a positivist, this requires the research to have internal validity. That is, statistically significant findings demonstrate relationships between conditions. However, since grounded theory is not interested in verification, one must look for internal consistency. Are the findings related to

significant aspects of the research context and are they credible to those who participated in the study?

Lastly, a reviewer would need to understand how to evaluate the generalizability of the study. When evaluating positivist research results one looks for external validity. That is, in what other contexts can the results be applied? Since the goal of grounded theory is a theory of a substantive area, one needs to determine whether the findings are transferable to other contexts thereby aiding in the development of further useful theories.

Table 5: Gasson's (2004, p. 90) Quality And Rigor Related To The Stages Of A Theory-Building Research Life-Cycle

Issue of Concern	Positivist Worldview	Interpretive Worldview
Representativeness of findings	Objectivity: findings are free from researcher bias.	Confirmability: conclusions depend on subjects and conditions of the study, rather than the researcher.
Reproducibility of findings	Reliability: the study findings can be replicated, independently of context, time or researcher.	Dependability/Auditability: the study process is consistent and reasonably stable over time and between researchers.
Rigor of method	Internal validity: a statistically significant relationship is established, to demonstrate that certain conditions are associated with other conditions, often by "triangulation" of findings.	Internal consistency: the research findings are credible and consistent, to the people we study and to our readers. For authenticity, our findings should be related to significant elements in the research context/situation.
Generalizability of findings	External validity: the researcher establishes a domain in which findings are generalizable.	Transferability: how far can the findings/conclusions be transferred to other contexts and how do they help to derive useful theories?

When doing grounded theory it is important to explicitly state when biases, theoretical serendipity, theoretical sensitivity, and influences of existing literature play a part in the analysis and emerging theory (Gasson, 2004; Strauss & Corbin, 1998; Roy Suddaby, 2006). Reflexivity is a key part of the process in order to create an audit trail that demonstrates the creation

of credible and consistent concepts throughout the research process. Ultimately, the grounded theorist should expect to be evaluated based on interpretivist discourse.

3.7.4. Conclusion

The study reported in this thesis is informed by this review in the following ways:

- 5) The researcher has clearly identified her personal ontology and epistemology as well as the epistemology of the research phenomena. This informed the version of grounded theory chosen for the study.
- 6) The context of the study is specifically constrained in order to derive a substantive theory.
- 7) The researcher has demonstrated a clear understanding of both the methodology and the methods.
- 8) The research has reported in such a way as to provide an audit trail that reflexively demonstrates the research process and the creation of credible and consistent concepts throughout the research process.

Grounded Theory Process. While this section is divided into linear sections, the narrative will demonstrate the non-linear process the researcher followed.

Creswell (2009) indicates there are three components to research design: 1) The researcher's philosophical world view (sometimes called epistemology); 2) The methodology related to that epistemology; 3) The specific activities the researcher undertakes to accomplish the inquiry strategy. Stage 1 discusses the concept of epistemology and identifies the epistemology of the research context as well as the epistemology of the researcher in order to understand how the researcher identified the phenomenon.

3.7.5. Stage 1: Identifying the Phenomenon and Context

As the Literature Review demonstrates, the phenomenon for this study arose from a sensitizing review of the literature on teacher professional development. A method for identifying the phenomenon and context (described in Section 3.5.2 Stage 1: Identifying the Phenomenon and Context) is to identify a gap in the literature. Reading about various professional development designs identified a connection between requirements for effective teacher professional development and communities of practice. The literature also demonstrated that Professional Learning Communities do change teacher practices and have an impact on student learning. While there is excellent research around the organizational development aspects (such as leadership, collaboration, values, etc.) that create a PLC, there is little-to-no research on how those pieces fit together to change teacher practice. The questions used to identify the study purpose were:

1. What are the context and conditions **within PLCs** that create and sustain change in teacher practice?
2. What is the general process by which the PLCs create and sustain change?
3. What role (if any) does situated learning, via communities of practice, play in creating the conditions that create and sustain change in teacher practice?

These questions led me to define the study purpose as follows:

The purpose of this study was to understand the context and conditions within PLCs that create and sustain change in teacher practice and, from that understanding, create a theory of teacher change in practice with explanatory and predictive power.

From this, a framework for understanding the processes and structure of the change in teacher practice will emerge.

3.7.5.1. Positionality and Ethical Considerations

When doing a grounded theory study, it is particularly important to state clearly the research context, participants, and the researcher's position

within the study to provide confirmability through reflexive self-awareness (Gasson, 2004). That is, providing information about the research context and participants, and being transparent about one's position within the study, allows a researcher to be reflexive about her own biases while she is conducting the research. This, in turn, allows her to be transparent in addressing those biases as she reports on the process and findings. As identifying context and participants is part of the grounded theory process, that information will be found in 3.7.6.1 Choosing a Site.

3.7.5.1.1. Positionality

Even though Savin-Baden and Major imply that identifying positionality in the final report is not usually needed in grounded theory (2013, p. 191), it is included here as reflexivity in both the process and the report demonstrate the quality and rigor of the research (Gasson, 2004; Barney G. Glaser & Strauss, 1967; Strauss & Corbin, 1998; Roy Suddaby, 2006). Figure 10: Personal stance framework (Savin-Baden and Major, 2013, p. 81) demonstrates the relationship of epistemology (discussed in section 3.2.3), positionality, and reflexivity. These are critical elements for the researcher to make clear about herself in order for the reader to find the results of the study confirmable, auditable, authentic, and transferable (Gasson, 2004).

Peshkin (1988) and Mauthner and Doucet (2003) discuss the impact a researcher's own subjectivity plays in the choosing of methods, the interpretation of data, and the reporting of results. They use their own experiences of research to highlight the ways in which their subjectivity influenced the results of their research. Both authors suggest that reflexively identifying and acknowledging one's own subjectivity, epistemology, and ontology, which take the form of personal values, experiences, and positions in the world, can bring greater understanding to both researcher and research consumer. As the researcher works through a particular methodology, making the effort to understand and document one's own reaction to what is being said can provide a positive impact on the research method as well as the research report (Mauthner & Doucet, 2003; Watt, 2007).

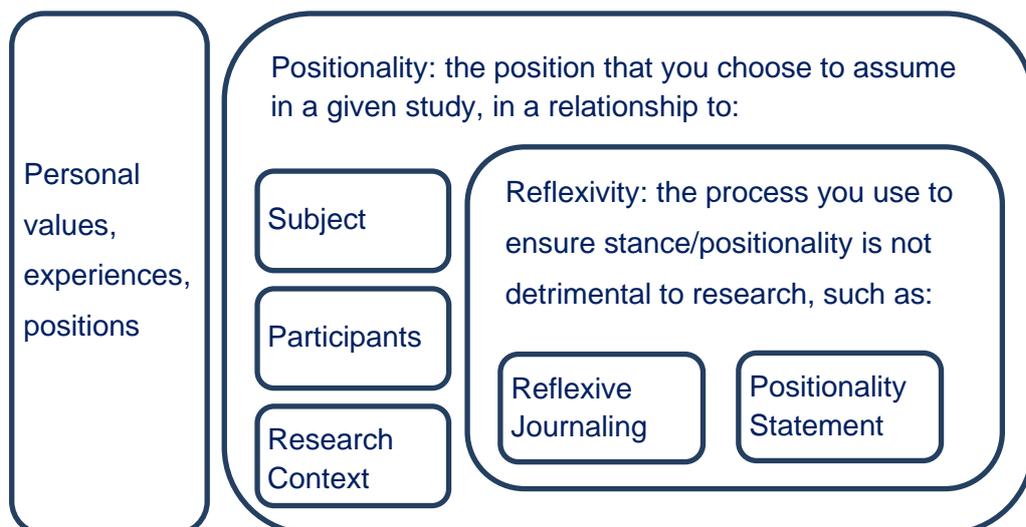


Figure 10: Personal stance framework (Savin-Baden and Major, 2013, p. 81)

Figure 10: Personal stance framework (Savin-Baden and Major, 2013, p. 81) demonstrates that the relationships between the researcher's subject, research context, and participants, must be made explicit. A researcher's personal values, experiences, and positions impact how she views and reacts to the subject, participants, and research context. These views and reactions drive choices and influence perceptions during the research process that impact the ultimate results of the research. Savin-Baden and Major suggest the way to ensure that the researcher's personal values, experiences, and positions do not have a negative impact is through reflexivity with regard to the subject, participants, and researcher context. The researcher should understand and account for personal positions that may impact her thinking during the research process. Savin-Baden and Major then suggest that two ways to do this is through identifying a positionality statement and reflexive journaling.

Identifying ones position with regard to the subject, participants, and research context allows those reading the research to understand whether and how the researcher's personal values, experiences, and positions have impacted the results of the research, because subjectivity plays a part in any qualitative research project (Peshkin, 1988). The positionality statement allows the reader (and the researcher) to be aware of any bias as the study flows from literature review to methodology choice and implementation to results (LeCompte, 2010).

Reflexive journaling through the research process surfaces the researcher's reactions to what she has heard or seen. It allows her to analyze those reactions and identify bias that may impact research decisions. Analyzing her reactions will also aid in the researcher identifying specific biases regarding the subject, participants, and/or research context.

In order to understand this researcher's position within the study, knowing her relationship to the topics at hand is important. Therefore, what follows is some personal history as it relates to the study. The purpose is to demonstrate my relationship to the study in order to facilitate the reflexive process.

- 1) Subject via my:
 - a. professional relationship to the subject
 - b. academic interest in the subject
- 2) Research context
- 3) Participants

3.7.5.1.2. Relationship to the Subject:

I taught grades 4-6 in the United States for 2 years. I left teaching mostly because I could not find another job in teaching without substitute teaching for 3-5 years first. I discovered corporate training as a career while working for a large corporation with a training department. This motivated me to obtain my Masters in Instructional Design Theory and I worked at several, large companies designing learning and training experiences for employees.

I have been studying and supporting communities of practice since I attended Etienne Wenger's "Foundations of Communities of Practice Workshop" in 2002 as part of my own professional development while working at a regional management consulting firm. My supervisor had taken the workshop and wanted to implement communities of practice at the company. It was going to be my job to cultivate those communities of practice.

I became an active member of CPSquare (The community of practice on communities of practice) that Wenger founded, and I served as the Treasurer of the community from 2008 until the community closed in 2015. Additionally, I have implemented many communities of practice concepts at various places of employment.

Therefore, I have experience designing and developing professional development, I understand a teacher's need for professional development, and I have a theoretical background and practical experience in communities of practice. This knowledge and experience impacted the way I reacted to what the research subjects said about learning in their professional learning community. I may have made assumptions of their experiences based on my own professional learning in a corporate environment that would not parallel their school environment. In addition, I may not have heard or understood some of their issues, because I had not experienced them myself since I only taught for a couple of years. Additionally, my "community of practice I" (Peshkin, 1988) heard some of their experience through a filter that influenced some of my conclusions.

I began my doctoral studies a year after I began working at Houghton Mifflin Harcourt in Dublin, Ireland. Houghton Mifflin Harcourt (HMH) is the largest K-12 learning company in the United States. I have always been passionate about learning and felt I had returned to my first love when I started working at HMH. Since HMH is primarily a content creation company and one of the types of content is professional development, learning about professional development seemed an appropriate research topic.

As stated above, I learned about communities of practice in my role as an Instructional Designer at a regional management consulting firm. The practicality of it made so much sense in a work environment. However, when I contrasted that with the learning opportunities I had as a teacher and as an instructional designer I could see that this particular learning theory could be powerful for each of those roles as well. As an instructional design program manager, I organized team meetings with the other program managers to standardize practice, create shared terminology, and define our regime of competence. As a learning design manager, I developed my team as a community of practice whereby we might each do our jobs our own way, but that we would regularly share our insights and methods in order to maintain consistent expectations for our internal customers and ensure we were using current best practices. In both cases, the teams exceeded expectations.

I understood how to cultivate a community of practice in corporate settings. This made me curious about how communities of practice for teachers came about and what the learning looked like in those communities. Since my own experience with communities of practice and learning involved

corporations and this experience drove my journey into social learning theory, there is potential that a lack of reflexivity around these positions could force me to see every aspect of the PLC as a nail, because my tool box only consisted of hammers.

My epistemological stance has changed over my career from thinking of learning as a primarily cognitive function to one wherein learning is primarily a social function. How this impacts the choosing of the methodology for this study is discussed in Chapter 3: Methodology (specifically Section 3.2.3 Personal Epistemology). My epistemological stance also influenced my decision to study Professional Learning Communities.

3.7.5.1.3. Relationship to the Research Context

My position within the study regarding the research context is someone who has studied and participated in communities of practice, but not PLCs. I have been an elementary school teacher, but we did not have PLCs when I taught. My Master's degree included a semester on organizational learning theory wherein we studied Senge's (2006) book, "The Fifth Discipline." All of this made me aware of the elements of PLCs, but with no specific frame of reference about how they functioned or why they were successful in changing teacher practice enough to improve student learning. My position regarding the research context is influenced by my current employer and my interest in communities of practice for learning.

3.7.5.1.4. Relationship to the Participants

My position within the study, in relation to the participants, was as an observer who was external to the communities in the study. My primary interaction with the participants was as an interviewer and observer who tried to understand PLC structure and process. The communities chosen were not near my home and I did not have any participation in their function or future. This allowed me to remain relatively objective in my analysis of the data gathered within these communities.

3.7.5.1.5. Mitigation

The primary method to mitigate bias based on my positionality with the subject, context, and participants of the research is reflexivity when dealing with data and research decisions. Reflexivity during data gathering and analysis was the biggest risk to mitigate within this study. My interest in and

experience with communities of practice had the potential to drive the emerging theory. However, the fact that I was aware of this throughout the research process and that I regularly checked with my PhD Supervisor to ensure I wasn't 'looking for and finding' communities of practice during open and axial coding helped mitigate the risk that this interest would drive the emerging theory.

Additionally, while I did not journal reflexively as suggested by Savin-Baden and Major (2013) or Watt (2007), I used the grounded theory method of theoretical memo-writing and diagramming to explore my relationship to what I was hearing and what my reactions meant with regard to the data. As Peshkin (1988) states, one's own subjectivity is not necessarily a negative as long as both researcher and reader are aware of its impact on the results. I tried to call out these potential conflicts as I described my research process below.

Strauss and Corbin state that, since a researcher is not able to approach a project *tabula rasa*, she should examine emerging concepts and theories at the data level and through the participants' eyes. The researcher's personal values, experiences, and positions might provide a certain level of sensitivity, but "it is not the researcher's perception or perspective that matters but rather how research participants see events or happenings.(Strauss & Corbin, 1998, p. 47)" When my memos raised issues of my perception driving the analysis, I would return to the data and re-read the passages and context of the data that drove the development of the concept.

Lastly, I purposely avoided references to communities of practice during the open, axial, and selective coding processes. Communities of practice theory did not appear until I started writing the story of my theory, as communities of practice theory helped to explain much of what was happening within the phases of the emerging theory.

3.7.5.1.6. Ethical Considerations and Approval Process

Issues of ethics involve the whole of the research process from recruiting participants to conducting fieldwork to reporting results (J. Creswell, 2008; Malone, 2003; McNamee, 2001; Stutchbury & Fox, 2009). Ethics review committees provide a level of guidance as the qualitative researcher

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prepares to enter the field. However, the nature of qualitative research is such that many of the potential ethical issues cannot be identified prior to entering the field (Malone, 2003; Stutchbury & Fox, 2009) and it is up to the researcher to behave in an ethical manner throughout the course of the research.

This study requires access to adult participants in communities that are private. The researcher sought and received ethical approval to conduct the research from the Research Ethics Committee within the School of Computer Science and Statistics at Trinity College Dublin. She submitted the Participant Informed Consent Form (Appendix B) to the Ethics Committee, which was approved. However, the Ethics Committee requested that the researcher also provide a similar Consent form for a school's Board of Management (Appendix A) to sign in order to ensure appropriate access to the members of the school district. This step of obtaining informed consent aids in the mitigation of causing harm while working in the field.

McNamee (2001) references Homan's writing about educational research and autonomy indicating that obtaining permission from high-level gatekeepers like headmasters (or school district superintendents) frequently removes the autonomy of those who report to the headmaster. However, since this researcher wanted to study PLCs in districts (as opposed to individual schools), permission from the community leadership (School District Superintendent – using the School Board Management informed consent form) was sought initially, because the researcher could not have sought access to other members of the district without it. In fact, the researcher was turned down by two school superintendents who had policies not to participate in research outside of their district.

The District-level PLCs were contacted via an email to the Superintendent of Schools for the district. The Superintendents signed both a superintendent consent form (Appendix A) (to ensure ethical access to the administrators and teachers) and a personal consent form (Appendix B), as recommended by the Research Ethics Committee. Prior to interviewing any individual, personal consent forms (Appendix B) were fully executed as well. As part of the Consent Form, all participants received a document that explained the study context and goals and that they were free to leave the study at any time.

Superintendents provided names and email addresses of administrators and administrators provided names and email addresses of teachers for interviews. In all cases, subjects were contacted via email first and those that indicated a willingness to participate were provided with the Informed Consent Form. These steps ensured that the research process took into account the schedules and work-related requirements of the participants. It also allowed potential participants the opportunity to decide for themselves whether or not to participate. In the primary district, the researcher contacted 20 people to participate. Of that 20, thirteen people agreed to be interviewed.

The data used were participant interviews, observations, and some non-technical literature. Data security and anonymity were potential ethical issues. Data security was managed by maintaining the data on private servers. Anonymity of the participants was preserved by numbering districts, schools, and participants, and not using names.

Theory development and the research report included collaboration with several of the participants in order to ensure that their voices were appropriately represented. Again, participants were contacted individually by email and able to decide whether or not they wanted to participate in this round of data analysis. Nine people were contacted and requested to review a summary of the emerging theory. Four people responded and provided oral feedback.

Since the researcher had no personal involvement in any of the schools or districts contacted there was little opportunity for coercion in order to obtain participation in the study. Additionally, as the summary of the theory provided for member-checking contained abstraction only, there was no way for participants to see or hear their specific comments as part of the theory (Malone, 2003).

3.7.6. Stage 2: Data Collection

Unlike hypothetico-deductive sampling in which the researcher gathers data via a sample of subjects that represent the general population (J. W. Creswell, 2009), grounded theory requires the researcher obtain data through theoretical sampling of events and processes with the goal of gathering data that will be useful in comparing to other data. Since, at the start of the

research, there is no data from which a theory is emerging and the data collection cannot be based on a preconceived theoretical framework, the researcher must identify the most likely place based on the little understanding she has about the phenomenon under study (Barney G. Glaser & Strauss, 1967).

The goal of the first sampling is a broad set of data that can be open-coded, analyzed, and categorized to begin the journey to an emerging theory. Strauss and Corbin (1998) recommend that the researcher address four key considerations when determining where to begin sampling.

- A site or group to study must be chosen.
- A decision must be made about the types of data to be used.
- Another consideration is how long an area should be studied.
- Decisions regarding the number of sites—whether to do observations, interviews, or both—depends on access, available resources, research goals, and the researcher’s time schedule and energy. (Strauss & Corbin, 1998, p. 204)

3.7.6.1. *Choosing a Site*

Based on the questions and purpose identified above, I proceeded to create criteria upon which to determine where to begin the study. The focus of this study was to understand the context and conditions within PLCs in the United States that create and sustain change in teacher practice.

In the United States, the school systems run from Kindergarten through Grade 12. Children start Kindergarten (K) around age 5 and complete grade 12 around age 18. A child in 5th grade is generally 10 years old. The grades are usually broken into three groups of schools:

- Elementary Schools consist of grades K through 4, 5 or 6.
- Middle Schools or Junior High Schools consist of grades 5 or 6 through grades 8 or 9.
- High Schools consist of grades 9 or 10 through 12.

3.7.6.1.1. Operationalizing CoPs and PLCs to Define Choices

According to Wenger, Snyder, and McDermott (2002), communities of practice consist of three key components:

- **The domain:** creates a common ground and a sense of common identity.
- **The community:** creates the social fabric for learning.
- **The practice:** provides the setting for learning through common frameworks, activities, language, etc.

I used this definition of communities of practice structure for making decisions about the community or communities of teachers to be studied. Professional Learning Communities (PLCs) were chosen as the type of community of practice to study, because they:

- 1) Meet the criteria above for being a community of practice
- 2) Change teacher practice (see Section 2.3.11)
- 3) Have quantified their ability to improve student outcomes (see Section 2.3.11)

This study focused on district-wide implementation of PLCs as research into communities of practice in school settings indicates that the school district is the appropriate unit of study (Cobb et al., 2003). In Professional Learning Communities the context of the school district determines what needs to be learned. Collaboration within the district-wide community drives teacher immersion into student learning and expands the opportunity for learning from each other. District-wide implementations of PLCs may consist of many PLCs within the single district or a single PLC in which everyone participates.

While Lave and Wenger (1991) nor Wenger (1998) alone operationalized a community of practice, Wenger (1998) provided additional criteria for defining a community through its practice along three dimensions: mutual engagement, a joint enterprise, and a shared repertoire. In their book chapter, Barab, MaKinster, and Scheckler (2004, p. 55) use Lave and Wenger (1991) and Wenger (1998) to define a community of practice this way:

“...a persistent, sustained social network of individuals who share and develop an overlapping knowledge base, set of beliefs, values, history,

and experiences focused on a common practice and/or mutual enterprise.”

Table 6 divides the operational definition into criteria and gives a general example of what would need to be part of the community in order for the community to meet the operational definition and be chosen for the study. It also identifies some specific criteria to address the concerns of this study.

Table 6: Teacher Community of Practice Selection Criteria

Criteria	Example	How the district shows it
General Characteristics of a Community of Practice		
Persistent, sustained social network (Community)	Teachers meet regularly.	Regularly scheduled group, school, and district meetings.
Developed an overlapping knowledge base, set of beliefs, values, history and experiences focused on the practice of teaching (Practice)	The goal of meeting regularly is to improve teaching practices.	Meetings focus on identifying teaching practices that would address specific student issues, discuss variations, and document approaches.
Uses assessment data to drive conversation among teachers to improve their practice and thereby improve the data (Domain)	The criteria that determines focus (and success or failure) is assessment data.	Conducts common formative assessment to create data for decision making.
Specific Characteristics to Meet the Needs of this Study		
All schools in the district participate	A district consists of schools with grades K-12. A district consists of schools with grades K-8.	All schools and teachers participate in the community.
Uses event-type training to provide additional PD	Provide a specific event where information about a new practice or theory is shared.	Schedules training events to support teacher learning. These events can be led by internal or external resources.

This is the primary criteria used to locate districts to participate in the study. Creswell (2013) states that logistics such as availability and location play a part in participant decisions. In my case, since I wanted to be able to have the opportunity to observe PLCs in action, I constrained the range of my search to a one-day drive of my home in the United States.

Since the early 1990s, there have been several scholars working on developing and understanding professional learning communities. Shirley Hord, Karen Seashore-Louis, Louis Stoll and Rick DuFour are the key leaders in bringing professional learning communities to the attention of educators. While Hord, Seashore-Louis, and Stoll discuss factors that aid in creating effective Professional Learning Communities (Hord, 1997; Seashore et al., 2010; Seashore Louis & Lee, 2016; Stoll et al., 2006), they have not operationalized the process of becoming and sustaining PLCs the way DuFour, Eaker, and Many have (Richard DuFour et al., 2006).

DuFour Eaker and Many (2015; 2006; 2003) have defined what a PLC is and how it functions so tightly that they have created a set of criteria by which to evaluate PLCs and their effectiveness. The All Things PLC website contains background, information, and research on Professional Learning Communities as defined by DuFour, Eaker, and Many. Based on the criteria identified above, I used the All Things PLC website (<http://www.allthingsplc.info/plc-locator/us>) to identify districts to participate in the study. This website provides contact information for schools and districts that meet specific criteria for being classified as a PLC. It also provides a map so schools and districts can be located by region, State, or specific area.

3.7.6.1.2. Choosing a PLC District

Even though I was identifying districts for the study through the All Things PLC website, it was not clear from the website how the districts structured their PLC membership. Locating the PLC membership structure (whole school/district versus grade level/discipline level per Section 0) would need to be discovered as part of the study. I approached five districts that fit the above criteria. Three of them declined to participate in the research study – for two of them, it was a matter of district policy in order to not disrupt or distract their teachers. Two districts agreed to participate. One district included grades Kindergarten through grade 8 while the other district included Kindergarten through grade 12. Following are details about the participants in this research study.

I chose to work with a district consisting of Kindergarten through grade 12 with nine elementary schools, three middle schools, and three high schools. I felt that this would provide a wide variety of PLCs to include in the study, regardless of where they defined PLC membership. The Elementary

Schools went from Kindergarten to grade 4, the Middle Schools from grades 5 – 8, and the High Schools from grades 9 -12.

The district started their PLC journey in 2009. There were approximately 11,500 students in three high schools, three middle schools, and nine elementary schools in the district. A key goal of the initial interviews was to understand the PLC membership structure in this district.

3.7.6.2. Types of Data Used and Length of Time Studied

Over the course of the research, which lasted two years, the primary source of my data was administrator and teacher interviews. I also observed several types of PLC activity over three days (see Table 10: District Observations in Section 3.7.6.4 for more detail). This started with interviewing the Superintendent and his three Directors (one for elementary, one for middle school, and one for high school).

After analyzing the superintendent and director interviews, I used two rounds of theoretical sampling to identify questions about and gaps in the data that lead to identifying other sources of data. The first round of theoretical sampling involved interviewing teachers in various PLCs within the district. The second round of theoretical sampling required locating sources of data that were outside of the district. They are:

- School #1, the primary, school-only PLC for this study, started its PLC journey as an independent school within a district in about 2009. There were approximately 670 students in this middle school. I interviewed the principal of this school.
- District #2 Superintendent was the superintendent of the other school district that agreed to participate in the study.
- Data Teams white papers obtained from Houghton Mifflin Harcourt's Professional Learning website.

One, student-centered school administrator was also interviewed. This person was identified somewhat serendipitously at the 2016 AERA conference when the researcher attended her presentation on creating the student-centered school.

Data was gathered from interviews and observations as they provided the “greatest potential to capture the types of information desired. (Strauss & Corbin, 1998, p. 204)” The interviews spanned roles (superintendents, directors, principals, and teachers) and grade bands (elementary, middle, and high schools). They also spanned different PLC experience levels. The observations were over three days and included professional development events and data discussions across elementary schools, middle schools, and high schools as well as district-level PLC meetings. Data gathering and analysis took approximately two years and included 15 interviews, three days of observation, and 3 documents reviewed.

3.7.6.3. *Data Management and Analysis Software*

I used three different software tools to aid in managing and analyzing the data: nVivo (QSR International), Evernote (Evernote Corporation), and Simple Mind. nVivo is a powerful qualitative data management and analysis tool. It provides the researcher the ability to import multiple formats of data (text, audio, and video) for coding and analysis. nVivo also includes many analysis tools. These include searching, word count, and visualization tools. nVivo has features that allow the analyst to memo and connect passages of text. I had no experience using nVivo prior to this study, therefore, I used nVivo primarily for importing text to open code it. nVivo also proved helpful in some early analysis with visualization tools (like Tree Maps and Wordles). However, while I tried to use some of the other features (like memos), I could not quickly figure out how to use it the way I wanted to. This was one of the reasons I used Evernote for writing and managing memos. The other reason was that I only had one license for nVivo while I have Evernote on all of my devices which allowed me to memo as I read something or as connections occurred to me.

Evernote is a powerful notetaking and sharing tool. I was able to create multiple notebooks to keep my life and research organized. A key feature of the basic version of Evernote is the ability to take a picture (with a smart phone) of a written document and create a memo in Evernote that allows the user to search on the text of the picture. The premium version has a feature called “context” that finds related memos and magazine articles for an open note. Evernote also allows for linking (via hyperlink) memos together. I used the picture to text and linking features extensively as a way to create

and follow a trail of analytical reasoning. I bought the premium version of Evernote during Selective Coding. Paired with the linking, the “context” feature helped me see some new patterns as well as some concepts I had not followed up on. The magazine links within Evernote are primarily for business magazines at this time. I received very few recommendations for articles and they were irrelevant to the study.

SimpleMind is a mind mapping software that allows the user to connect and analyze ideas. It allows for the import of multiple media types and adding notes to elements of the mind map. I used SimpleMind extensively throughout the analysis process. Being able to visually connect the sub-categories to the key category and the properties and dimensions to the subcategories facilitated the articulation of the storyline and identified gaps in understanding. Many times a mind map became the basis for a memo and I would create a screenshot of the mind map and place it in the Evernote memo.

I used nVivo on my personal computer only while SimpleMind was on my work computer. I had Evernote on both personal and work computers as well as my phone. This stable of tools (along with my paper research journal) proved to be an efficient way for me to manage the data gathering and analysis process.

3.7.6.4. Initial Data Collection and Context of the Study

The purpose of gathering data is to maximize opportunities for comparing events and processes, so the initial collection of data should sample purposefully with the goal of being able to create as many categories as possible (Strauss & Corbin, 1998). I conducted a sensitizing interview with the District Superintendent of Schools to explore the possibility of conducting a research study in his district. This interview took the form of an informal, two-way conversation to determine whether the district was suitable for my research and whether my research process would be appropriate for their district (see Table 7: Initial Interviews).

As a result of my initial conversation with the Superintendent of Schools I started interviewing the grade band directors, because they are community leaders who are also “Master” level teachers who have the knowledge and expertise to guide the rest of the teachers (Lave & Wenger, McDonald, Barbara

1991). Each of these directors had been Principals of schools in the district and had independently attempted to create PLCs in their schools before the Superintendent came on board. By interviewing the directors, I sought to understand the contextual changes in the district and how they impacted the goals, structure, and processes of the community for incorporating professional development into community activities.

Table 7: Initial Interviews

Position	Interview Date	Interview Length	#Pages/Words
Superintendent of Schools	7/21/2014	30 minutes	Not transcribed
Director of Middle School Education	8/18/2014	45 minutes	9/5425
Director of High School Education	8/19/2014	30 minutes	7/3360
Director of Elementary Education/Title I	8/19/2014	45 minutes	10/6080
TOTAL - 4		195 minutes	33/19,131

The Directors that I interviewed at the primary district for this study had all been principals (one in a High School, one in a Middle School, and the third in an Elementary School) within the district before they became Directors. As principals, they had each concluded that Professional Learning Communities would help their schools have better results and had begun implementing the structures within their schools. Shortly there-after, a new Superintendent arrived who also believed that Professional Learning Communities would improve the District. These three principals were promoted to Directors and charged with implementing PLCs within their grade band. My interviews with them were all positive and while they mentioned struggles, they did not dwell on them. It was their dual experience of implementing PLCs at their schools (as principals) as well as across their grade bands (as directors), that made them particularly suited for initial interviews.

In order to understand the complex behaviors of the members of the PLCs I used an unstructured interview format. This helped avoid any *a priori* categorization that would limit my field of inquiry (Fontana & Frey, 1994). Several of the initial interviews started with “Tell me about your experience of your district’s journey to become a PLC.” Prompts for further information consisted of questions like, “Why do you think you did it that way?” “What do you think was the impact of that decision?”

These interviews resulted in a beginning list of concepts (see Table 8: Sample of Initial Codes) that developed an initial understanding of the PLC context at the district. One of the Directors interviewed said,

“I want to backup, because a huge change we made in the middles schools is this. I’m sure you’re aware of the whole big middle school teaming concept. Which is where you have an English, Math, Science, and Social Studies teacher who have planning together and they also share the same students. You with me? Those 150 loop through them. We switched that. We switched that to where there is no more teaming, per se—kinda sort of, it’s there – but our teachers do not have plans by team. It is absolutely by department. So all English teachers are off on this period. All Math, all Science, all Social Studies have their particular period off per day. 50 minute periods for us.”

Table 8: Sample of Initial Codes

Codes
Focus on student learning
Roles
Getting it done
District structures
Awareness
Changes in direction
Accountability
Teacher evaluation
Leadership
Instructional Strategies
Principal is key
Change in structure
Distractions
Collaboration
Competition

Additionally, these initial interviews allowed me to locate the membership structure for the PLCs in the district. That is, as discussed in Section 0, the PLCs were located at the grade or discipline as opposed to generally throughout the school or district. Each grade at each elementary school was considered a PLC. Grades 5 and 6 are in middle schools and had discipline specific PLCs by grade. From grade 7 (grades 7 and 8 were in the middle school) through grade 12, the teachers were grouped into PLCs by subject within the school. Figure 11: Grade/Discipline PLC Structure Examples demonstrates examples of the PLC configurations. As the PLCs

each developed, they began reaching across schools to collaborate with and support each other.

Grade/Discipline PLC Examples

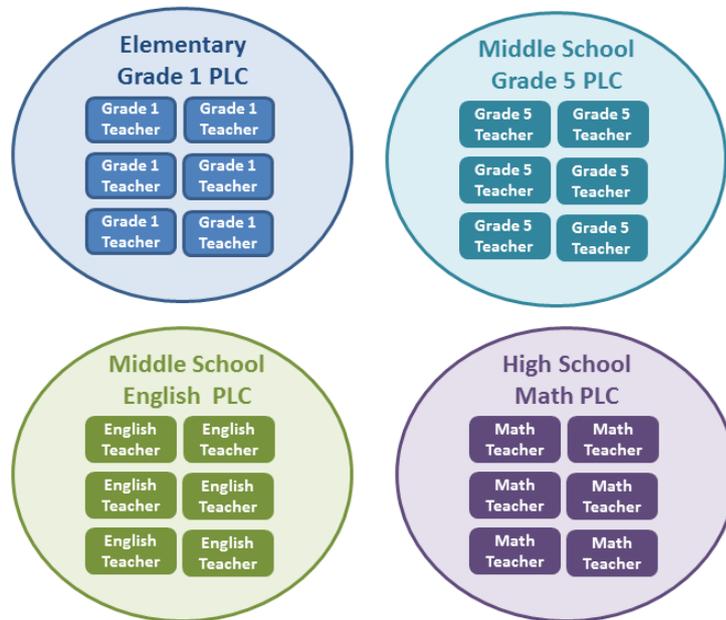


Figure 11: Grade/Discipline PLC Structure Examples

Within the district there were 15 schools (nine elementary schools, three middle schools, and three high schools) and each one had PLCs focused on Mathematics and English. Among the nine Elementary schools the PLCs were grade level which reflects the nature of the structure where teachers are generalists. Because the State focuses so much on English and Math scores, the PLCs are also focused on these two disciplines.

And so we developed systems: spreadsheets of success, data rooms where we can go in and immediately--with our grade-level teams--look at, 'okay, here's where Johnny is two weeks from now. okay, here's where sally was, okay here's where sally is now.' And we are constantly monitoring student progress within that leadership team structure.

Our grade-level teams, again, meet at least once a week, and an administrator sits in every grade-level team. And the grade-level looks at our data, our common, formative assessments within that grade-level team structure--whether they need to work with the literacy coach or a math teacher leader or

whatever they are finding with their students--then they will call upon the building expert.

In the first two years of Middle School, teachers are still generalists, so the PLCs are by grade (5 and 6) and also focus on both Mathematics and English. The second two years of Middle School the school structure transitions to teaching by discipline. Therefore, the Mathematics and English disciplines form PLCs.

It is absolutely by department. So all English teachers are off on this period. All Math, all Science, all Social Studies have their particular period off per day. 50 minute periods for us. So that our expectation is that they meet together a minimum of once a week and more than that is up to them. It was a huge shift for us. But we knew that if we were going to expect people to change instructional strategies, they needed to be off with the people they needed to talk with, if that makes sense.

At the High Schools, they implemented PLCs first with the Mathematics and English disciplines. At the time of this research, the district was in the process of implementing PLCs for the other disciplines as well. However, since there are not as many classes in some of the other disciplines, it was difficult to find a group of teachers to work together.

What do you do when the students don't get it. That's where we do the, what we call, the Acceleration and Interventions. We don't call it remediation in our district. Our Superintendent is big about acceleration and intervention. So math and language arts do a lot of that.

There were other concepts and processes emerging from the data that (through theoretical sensitivity) lead me to interview the Superintendent from the other school district that agreed to participate in the study. That interview (see Table 9: Theoretical Sensitivity-Led Interview) served to reinforce the goals, structures, and processes of that were emerging from the district. The data from this interview added to the concepts and clarified the language used to describe the PLCs and their development.

Table 9: Theoretical Sensitivity-Led Interview

Position	Interview Date	Interview Length	#Pages/Words	
Secondary	Superintendent	11/3/2014	45 minutes	7/4266

Additionally, I spent three days in observation at the district. This observation happened after two of the above interviews were transcribed and coded and consisted of observing various Professional Learning Community/Professional Development meetings across elementary, middle and high school settings. The observation data was neither transcribed nor coded, but the write-up of notes about what I saw increased my theoretical sensitivity when I continued coding and analyzing data as the observations provided specific contexts and processes for reference. Table 10: District Observations details the types and numbers of meetings observed.

Table 10: District Observations

Type	Observation Date	Number
Data discussions – grade level	11/5/2014	2
Data discussions – district level	11/6/2014	1
Training – grade level	11/4/2014	2
Training - grade band level	11/4/2014	2
Classroom	11/5/2014	3

The interviews with the two superintendents and three directors, along with the observations, provided enough data to begin identifying patterns that would turn into categories. However, the properties and dimensions of those patterns had barely begun to emerge. Therefore, I conducted more data gathering.

3.7.6.5. Further Data Collection

The rest of the data collection for this study was driven by theoretical sampling. The purpose of theoretical sampling at this point is to develop and deepen the initial categories until no new insights are generated from additional data. I interviewed seven teachers and one principal from the primary district (see Table 11: District Interviews), a principal from a school-only PLC, the superintendent of a student-centered school (see Table 12: Additional Sources), and to read some non-technical literature on data teams (see Table 13: Non-technical literature). I attempted to obtain interviews from school districts using the data team process but was unable to find anyone who would speak with me. More detail on the theoretical purpose for and result of these interviews is found in Section 3.7.7.2 Theoretical Sampling that

Informed Axial Coding and 3.7.7.4 Theoretical Sampling that Informed Selective Coding.

3.7.6.5.1. District Interviews

I had requested interviews with 18 people in the district. I was able to interview the three directors mentioned above as well as 1 principal and 7 teachers.

The interviews with the teachers (Table 11: District Interviews) were also positive, but I did hear more about the struggles faced and how they were overcome (or not) from them. This provided data that helped me define properties and ranges of behavior. There were still some gaps and questions that needed to be filled/answered.

Table 11: District Interviews

Position	Interview Date	Interview Length	#Pages/Words
Grade 4 teacher	3/23/2015	35 minutes	8/4698
Grade 6 English teacher	4/03/2015	37 minutes	9/4846
Science teacher	4/06/2015	45 minutes	10/5942
Grade 4 teacher	4/06/2015	22 minutes	6/3001
Grade 1 teacher	4/13/2015	27 minutes	7/3506
English teacher	5/08/2015	30 minutes	7/3063
English teacher	5/29/2015	35 minutes	7/3645
Middle School Principal	10/23/15	23 minutes	5/2707
TOTAL	8	254 Minutes	59/31,408

The analysis processes that lead me to interview the above participants are detailed in Section 3.7.7.2 Theoretical Sampling that Informed Selective Coding, Theoretical Sampling that Informed Axial Coding and in Section 3.7.7.4 Theoretical Sampling that Informed Selective Coding. Below are descriptions of the participants themselves.

Grade 4 PLC at Taft Elementary School – Teacher and Math Chair:

This teacher had 24 years teaching experience. This teacher was the Math Department Chair for the district and had been with the district since before the start of creating the PLCs. This teacher was able to help me understand the before and after experiences with professional development at the district
McDonald, Barbara

and with grade 4 teachers. Additionally, this teacher helped me understand the development and current functioning of the PLCs in the district.

Grade 6 PLC at Wilson Middle School – English Teacher: This teacher had experienced two different situations prior to coming to the district in the study. This teacher was with a very large, public school district and a small, private school. This teacher was able to provide the perspective of someone who had worked outside of a PLC and then participated in an active PLC.

Science PLC at Roosevelt High School – Grade 10 Teacher: This teacher had experience within a PLC at another district as well as in the PLC that was in the process of forming in this district. Since the US reform movement is focused on improving Math and English Language Arts test scores, the Science department was only in the early stages of developing their PLC when I was conducting interviews. This teacher was able to provide many examples of the issues that emerge when the Four Critical Questions are not fully addressed.

Grade 4 PLC at Garfield Elementary School – Teacher: This teacher was interviewed specifically because she had come to the research district from another district. This teacher had come from another district that also had PLCs. However, she was part of the PLC development process at the previous district.

Grade 1 PLC at Monroe Elementary School – Teacher: This teacher was interviewed specifically because she was a beginning teacher. This teacher came to the profession as a mature adult and waited to get a job in the research district, because she was so familiar with it.

English PLC at Lincoln Middle School - Grade 8 Teacher: This teacher was interviewed specifically because she worked in a Middle School and was part of a discipline PLC (ELA). This teacher was also able to discuss the difference in professional development from before to after the PLCs were implemented.

English PLC at Roosevelt High School – Grade 11/12 Teacher: This teacher was interviewed to get the perspective of a High School teacher who was part of a functioning PLC. This teacher had taught at other schools

and began teaching in the research district the year before the district started calling what they were doing a PLC.

Middle School Principal: This Principal was interviewed in order to understand the Principal’s perspective in the process and structure of developing and sustaining PLCs in a school.

3.7.6.5.2. Additional Sources

The emerging theory and serendipity worked together to add variation to the emerging theory (see Table 12: Additional Sources). The emerging theory encouraged me to look for a PLC implemented in only one school within a district. I obtained information on a nearby PLC that was only implemented in one school within a district from the All Things PLC website. Serendipity came into the equation when I was attending the AERA 2016 Conference. I had been struggling with the relationship of one of the categories to the rest of the categories; in particular, the “Focus on Student Learning” category. Was it central or supportive? Until the AERA Conference, I had only been able to access personnel from traditional schools that became PLCs. At the AERA Conference I attended a Systems Thinking Special Interest Group (SIG) Business Meeting and met a woman who had created and run a “student-centered” school based on Montessori principles. She agreed to be interviewed for the study, and this data confirmed the importance of focusing on student learning as a driver for student and teacher learning success. It also, somewhat surprisingly, confirmed the importance of the community of practice in creating and sustaining that focus.

Table 12: Additional Sources

Source	Position	Interview Date	Interview Length	#Pages/Words
School Only PLC	Principal	4/03/2015	42 minutes	11/6129
Student-centered School	Principal/ Creator	4/25/2016	47 minutes	10/6164
TOTAL		2	89 minutes	21/12,293

The last type of data used for this study was some non-technical literature on Data Teams (see Table 13: Non-technical literature). Data Teams

are a Professional Service offering from Houghton Mifflin Harcourt that creates a collaborative model for implementing data-driven decision making at the instructional level. As I was sharing my study with a co-worker in Professional Services, she said, “They might call themselves Professional Learning Communities, but what they do is Data Teams.” Considering that some of the materials I had seen while observing District #1 were Houghton Mifflin Harcourt materials that are part of the Data Team service, I felt it was important to find out more about the similarities and differences between Professional Learning Communities and Data Teams.

Table 13: Non-technical literature

Source	Subject	Information	Access Date
Website	Data Teams	http://www.hmhco.com/classroom/m/classroom-solutions/professional-services/practice-based-services/data-teams	7/16/2015
Documents	Data Teams	3 White Papers with a total of 43 pages.	7/16/2015 & 10/12/2015

As the grounded theory approach dictates, each of the data sources identified above were coded and analyzed as soon as possible after they were collected. The above presentation order does not imply the order the data was collected.

3.7.7. Stage 3: Analysis

While open coding is designed to generalize data into individual concepts and begin identifying patterns, axial coding is meant to identify the relationships within and among the emerging patterns to begin telling the story of the emerging theory (Strauss & Corbin, 1998). These activities are discussed here in a linear format to demonstrate mastery of them by the researcher. However, open and axial coding are, as stated in Section 3.5.4, frequently cyclical and sometimes simultaneous activities (Luckerhoff & Guillemette, 2011; Roy Suddaby, 2006). They certainly were for this thesis. This section describes the analysis of data gathered and used in primarily open and axial coding processes and highlights instances of the use of grounded theory strategies as outlined in Section 3.5.4. Chapter 4: Open and Axial Coding provides the key category descriptions and relationships identified during these cycles.

3.7.7.1. Open Coding Stage

3.7.7.1.1. Coding and Analysis

The open coding process was an immersive process. I read and re-read each of the interviews and identified phrases, sentences, and paragraphs within the text that represented concepts. Each of these concepts was given a code. As often as possible, these codes consisted of a word or words found within the text (in vivo coding). Passages (usually sentences or short paragraphs) were frequently coded with multiple codes as they represented more than one concept, but those concepts were tightly tied together within the context of the passage. Understanding the context of the codes became critical to the process of identifying relationships between codes as the research progressed. Below are two examples of passages with multiple codes. The first one (Figure 12: Coding Sample #1) shows what the coding looks like in nVivo. The second example (Table 14: Coding Selection #2) is an extract from an interview with the codes identified in the column next to it.

Where are things going well? Where are things not? And after the principal has had meetings with the teachers about it, then I meet with the three principals at a District level, just MS people on... and IU only get the results, Barb, by Building. Nothing by a teacher is reported to me. None of this has anything to do with their evaluation. But the principals come to me and go Hazelwood, on indicator 8.3.2, which might be math ratios... whatever it is... Our goal is to have an 80% or better. Ah we didn't, Rhonda, we had a 77%, but here's what the teachers are doing to try to get some growth in that area. So that's step 2. Then, Barb, we go a step 3. And that is a District-wide – and our superintendent calls it System to System meeting. So the elementary principals are there. And the middle school principals with me. And the high school. And we all report out in front of our superintendent – here's what it looks like. So that we have discussion and dialogue on ratios all the way up through what it's looking like. Lots ... I'm going to throw this in, Barb, just because I'm going to tell you what I think makes the difference. So when you find people in Districts that are able to do that work – pacing guides, common formative assessment – I hope you can add something in here about...it's all about that effective building leader. Be cause that huge part of this, in my opinion, is that art of being genuine with your people your teachers and building trust so that people have a very clear understanding that this is NOT about your evaluation. This is not really about your teaching at this point. It is about our kids learning what we said they are going to learn, and we are here to help each other get better. So if we want to trade classrooms awhile. If we want to have more meetings to talk about specific instructional strategies, that's what we are going to do. But I would emphasize, Barb, my belief is that building principal is crucial to this whole process. If teachers in a building don't trust that person, this is almost impossible, is what I've come to believe.

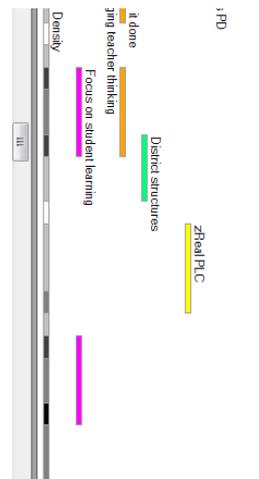


Figure 12: Coding Sample #1

nVivo software allows the user to scroll through a passage and see the codes associated with it. The above example (Figure 12: Coding Sample #1) shows a color and column for each code used in the passage displayed. This is an example of how the same passage would be coded with more than one concept. nVivo tracked the codes I had already used so that I could use them again easily and avoid creating slightly similar codes with essentially the same meaning. This saved a great deal of frustration in the long run, because several times something was coded with a plural version of an existing code or with a different tense or even a different spelling. In those cases I went

back to the text, to ensure there was not a reason for the difference, and updated the code. Using the tools in nVivo helped me find specific context references during microanalysis quickly and easily.

Table 14: Coding Selection #2

Interview passage	Codes for this passage
<p>So there are a couple of structures that I have found that are critical ... uhm, for a professional learning community. Of course, learning, collaboration, and results -- well learning starts with the teacher. So we've had some amazing professional development with some unbelievable consultants around the nation that have come in and worked with us on a continual basis. However, I have to tell what I believe -- that's important and that's good, but we've created a coaching culture that is critical. Because when people get to a hard spot, they go back to what they know. And having a coach, literacy coaches... in elementary I have literacy coaches and then I have math teacher leaders -- and you've gotta have that support in place that is supportive, that is not evaluative, so that when somebody tries something that they've learned and it doesn't go so well, they don't revert back to what they know. They've got a support there that can help them through that. I have also learned that you cannot explicitly teach, what you do not explicitly know yourself. Therefore, that whole professional development piece and that whole coaching piece is critical, because we have create shared understandings -- the art and science of teaching reading, the art and science of teaching writing, the art and science of teaching math -- all of those things are our focus in what WE ourselves are learning. That first big idea -- learning -- what are WE learning as the adults, that in turn benefits the learning of our children. What do we explicitly KNOW so that in turn we can explicitly teach and children can explicitly learn. So that's a huge structure.</p>	<ul style="list-style-type: none"> • Learning • Coaching Culture • Professional Development • Focus on Student Learning • Collaboration • Support • Three Big Ideas

The coding example above (Table 14: Coding Selection #2) demonstrates how I attempted to use *in vivo* codes to represent the concept

as closely to the original meaning as possible. “Learning” is used multiple times throughout the passage. However, ‘learning’ is also one of the Three Big Ideas (learning, collaboration, and results) that was also mentioned in other interviews. Therefore, the first and last passages are coded with both *in vivo* codes (‘learning’ and ‘Three Big Ideas’) as well as other passages being coded with ‘learning’.

Microanalysis

The coding examples above also demonstrate the initial microanalysis I did while open coding. That is, understanding the context within which the term learning is used throughout the multiple interviews. Is ‘learning’ used in terms of teacher or student learning? Was it used along with the other Three Big Ideas? Is it used as a verb or a gerund? Was it describing what they were doing or naming it? Sometimes these microanalyses lead to creating a code memo to document my questions and thoughts about what a code means. The coding memo (Figure 13: Open Coding Stage Coding Memo Example) entitled “Personnel Structures” provides an example of a coding memo written during the Open Coding Stage.

Personnel Structures – 10/16/2014
Interview #2 (District 1, Middle School Director) is talking about the personnel restructuring that happened to make the PLC a priority. I think Interview #1 and Interview #3 mention it, too.

Certainly the Teacher Evaluation Structure plays a part in helping to make the change as well as sustain it.

This is something I need to explore more.

Figure 13: Open Coding Stage Coding Memo Example

Memos

The memo (Figure 14: Open Coding Stage Theoretical Memo Example) entitled “Change in practice – requirements” is an example of a theoretical memo. That is, it demonstrates beginning connections and patterns the researcher identified that may lead to a theory. This particular example also demonstrates how the memos employ reflexivity in the memo process, in that I mention things I read (McLaughlin and Mitra article) and the things I was experiencing professionally (reference to “first principles”) that impacted my thinking at the time.

Change in Practice – requirements 9/10/2014

Reading a journal article about sustaining theoretical change (McLaughlin and Mitra) and a couple of things are jumping out at me.

PLCs don't really require extra resources to come into existence, but they do require structural/HR-related changes.

The other thing that is occurring to me as I read this has to do with a comment about first principles... As the SFT change group was trying to move the program to the ownership of the schools/teachers, the teachers balked. Once the teachers accepted responsibility, the comment was made, "I know what it was now... You guys were asking us to think. We didn't want to do that. It's tough to rethink what you've been doing."

This resonates a lot with what I heard from Interview #2 at District #1. The four questions force teachers to think about what they are doing and why and this is the difficult bit. Interview #2 said that it's the ability to answer these questions that makes you a PLC or not. A lot of districts won't do the work to make this change to THINKING about what you are doing in your classroom. What does that mean? How do the regular meetings support, enhance, or detract from a teacher's ability to think about what she's doing?

...<NOTE: there was more to the memo, but was extraneous to the point being made>

Figure 14: Open Coding Stage Theoretical Memo Example

Throughout the coding and analysis process, I used Evernote to maintain my research Memos. I chose Evernote, because it went on all of my devices and allowed me to create memos whenever they occurred to me. Additionally, Evernote made my notes searchable (even pictures) and, when I paid for the premium features, it showed me other memos with similar content or themes. I set up a notebook called "Research" and four sub-notebooks called "Research Journal", "Research - Memos", "Research – Key Literature Articles", and "Research – Misc." I did not think in terms of Coding, Theoretical, and Operational memos, and the folder structure demonstrates this. I did not really see a difference between Coding and Theoretical memos initially; they were all written in the Research - Memos notebook. "Research Journal" is where I kept track of my operational decisions. I have the following number of entries in each sub-notebook:

- Research Journal – 76
- Research – Memos – 135
- Research – Key Literature Articles – 1
- Research – Misc. – 20

Additionally, I kept a written Research Journal. I started the written journal on the day I began my PhD journey and have kept notes from classes, articles and books read, theoretical memos and diagrams, trips for work and school, and meeting notes with my Supervisor. I took pictures of any hand-written theoretical memos and diagrams and added them to Evernote.

I created the first Operational Memo (Figure 15: Open Coding Stage Operational Memo Example), to track decisions made through the research process that lead me to the emerging theory, on October 17, 2014. This memo documented my entry into the field.

Entering the Field 10/17/2014
In August, 2014, I scheduled my first three interviews with the Directors at the District #1. I had talked with the Superintendent prior to entering the field and have some notes, but I decided to interview his 3 grade band directors using a bit of what he'd told me to guide my questions.

It took me a couple of months (for various reasons) to complete the transcription of all three interviews.

It's now mid-October, and I have begun Open Coding the interviews in the order in which I did them.

I have also made plans to observe their PLC meetings and some room set ups on November 5th and 6th, 2014.

Figure 15: Open Coding Stage Operational Memo Example

Diagrams

During the Open Coding Stage, I primarily used mind maps and nVivo data maps for diagramming the data to tease out patterns and relationships. A mind map or diagram was most often the basis of a theoretical memo. The “Change in Structure” theoretical memo (Figure 16) demonstrates looking for

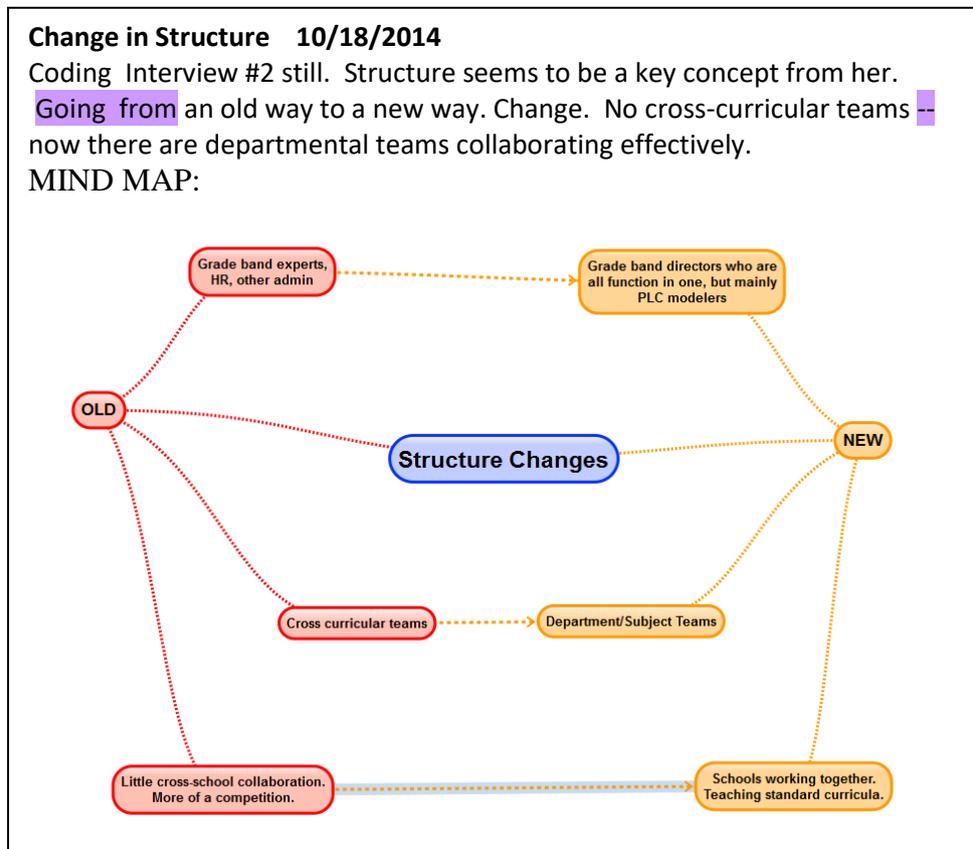


Figure 16: Change in Structure Theoretical Memo

practice was a key concept in my early thinking about the phenomenon.

The theoretical memo, “First exploration of data and analysis - Tree Map,” (Figure 17: Open Coding Theoretical Memo Example) was my first attempt to look for patterns in the data. I used these sorts of memos to refine my theoretical sensitivity, by taking an agnostic approach to looking at the data. Even with the agnostic approach, I was thinking in terms of The Three Big Ideas being central to the data, but by reflexively memoing the connections I was able to realize that I was forcing the data and to step back and look at the concepts I’d coded and identify the generalizations that created their own patterns.

study. The researcher must both micro-analyze the data and take a big picture view of the context within which the codes reside to ensure appropriate interpretation. The example of the importance of context that Strauss and Corbin (1998) use involves the labels “birds”, “planes”, and “kites”. In one context they might be categorized as “flight” while in another “instruments of war.”

Glaser (1978, p. 57) indicates that it is important for the grounded theory researcher to “focus on patterns among incidents which yield codes, and to rise conceptually above fascinating experiences.” In an effort to see the relationships of the codes one to the other, I used nVivo Tree Maps, mind maps, and nVivo Wordle maps. The theoretical memo below (Figure 18: Open Coding Pattern Analysis Memo) demonstrates how my lack of knowledge of nVivo helped me discover some initial patterns as well as identify some initial gaps in understanding (NOTE: much of this memo contained screenshots of nVivo settings; I have left this information out due to space restrictions).

More on Collaboration 12/30/2014



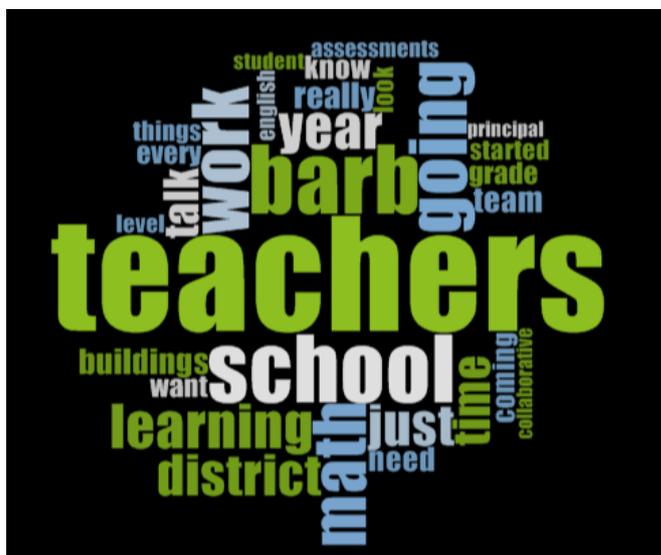
So this shows (I believe) the frequency of the other nodes coded in the same text when I coded text as "collaboration". I think it's interesting that Collaboration is centered around the words District Structures, 4 Questions, District, Pacing Guides, Principal is key, Discussion, Teacher Evaluation, and Leadership.

I had focused on the codes: Pacing Guides, CFA, Teams, and Discussion.

Looking at this, it seems that perhaps those interviewed considered these concepts as critical to creating and sustaining collaboration. What happens when these elements aren't part of the PLC? Is collaboration still available? What would be the perception of what was missing if, one or more of these elements was not available?

Figure 18: Open Coding Pattern Analysis Memo

The Wordle below (Figure 19: Open Coding Pattern Analysis Example) was a word count with codes associated with the concept of "learning". It was one of the less-helpful visual representations in that it did not trigger any



associations for me.

The idea of change kept arising in my thinking as I was looking at the long list of codes I had created (approximately 70 at this point). The mind map below (Figure 20: Open Coding Relationship Mind Map) helped me think about the list of codes in relationship to creating and sustaining teacher change. The process I used for creating this mind map was to consider the codes I had created that I thought might influence teacher change and review their context within the interviews. This allowed me to pull out words and phrases from the interviews that provided more context and meaning than the generalized codes. While this is not the only analysis tool that led me to the initial category list, it was a critical one.

Strauss and Corbin (1998) describe the need to move from specific

Figure 19: Open Coding Pattern Analysis Example

concepts to more abstract higher order concepts that they call categories. One does this by “grouping similar items according to some defined properties and giving the items a name that stands for that common link.”(Strauss & Corbin,

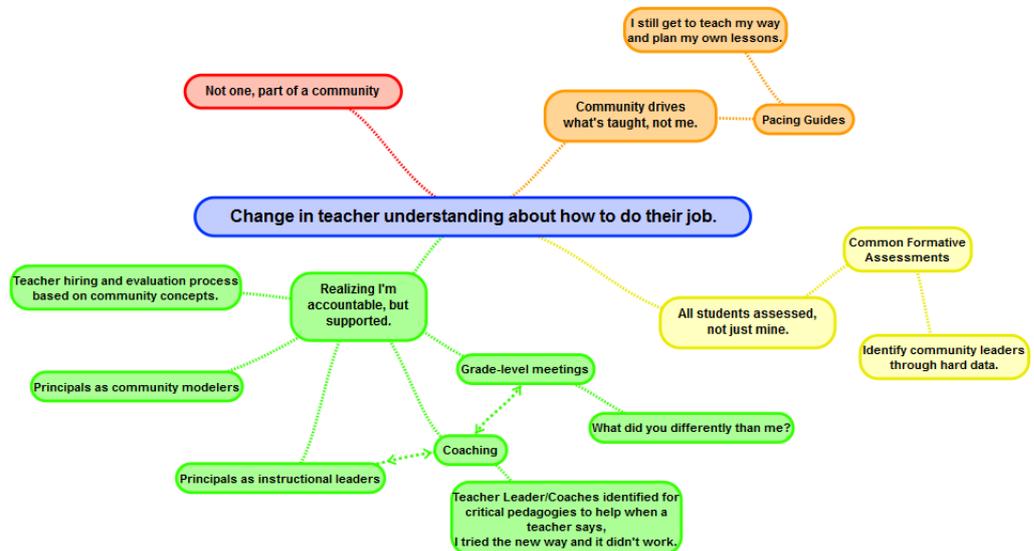


Figure 20: Open Coding Relationship Mind Map

1998, p. 121)” From the initial codes, I identified seven, over-arching concepts under which I placed the remaining codes as sub-categories (key concepts of the category) or properties of the concept sub-category. The seven, over-arching concepts were:

- Community
- Data

- District Structures
- Focus on Student Learning
- Framework
- Leadership
- Professional Development

These concept category codes were all present in the initial code list and represented, for the researcher, concepts for which the rest of the codes were descriptors – sub-categories, properties and dimensions – of the category. There were four codes in the initial list that I felt were redundant as a result of coding one interview twice. As happens with many first-time grounded theorists, I jumped to analysis and categorizing during my first coding pass rather than words or phrases that conceptualize the text. They were marked with a preceding “z” for sorting purposes and set aside during the initial category development process.

The table below (Table 15: Initial Categories) represents the initial key conceptual categories (in alphabetical order) and the pattern of how the rest of the codes relate to those conceptual categories. Since the generation of the initial categories is the beginning of pattern identification and is part of the Open Coding process, the lists below do not contain many properties or dimensions. Most of the properties and dimensions emerged from Axial Coding wherein I spent more time looking at the relationships of the codes one to the other.

Table 15: Initial Categories

Community	Data	District Structures
<ul style="list-style-type: none"> • Accountability • Coach • Collaboration <ul style="list-style-type: none"> ○ Common Formative Assessments ○ Pacing Guides <ul style="list-style-type: none"> ▪ Work ○ Teams <ul style="list-style-type: none"> ▪ Distractions ▪ Getting it Done ○ Writing Together • Discussion • Interdependent • Meeting • Revert Back to What They 	<ul style="list-style-type: none"> • Common Formative Assessments (CFAs) • Results • Rigor • Student Assessment 	<ul style="list-style-type: none"> • Board of Education • Change in Structure • Clarity • Counselors • District <ul style="list-style-type: none"> ○ Changes in Direction ○ Culture <ul style="list-style-type: none"> ▪ Continuous Improvement ▪ Embedded • Electives • Enrollment • Focus <ul style="list-style-type: none"> ○ 5 Easy Steps Program • Hiring

<p>Know</p> <ul style="list-style-type: none"> • Share Ideas • Shared Terminology • Shared Understanding • Stunning • Together 		<ul style="list-style-type: none"> ○ Core Competencies ○ Roles ○ Teacher Evaluation <ul style="list-style-type: none"> ▪ Evidence ▪ Observation • Politics • Quarter • Reporting • Same Things • Schedules • Shift • Silos <ul style="list-style-type: none"> ○ Competition • Time • Time Blocks for Teaching • Tough
<p>Focus on Student Learning</p> <ul style="list-style-type: none"> • Bought Into • Instructional Strategies • Socio-economics 	<p>Framework</p> <ul style="list-style-type: none"> • 4 Questions • Awareness • Common Formative Assessments (CFAs) • Motivation • Organic • Pacing guides <ul style="list-style-type: none"> ○ Rigorous Curriculum Design ○ Work • Question 1 • Question 2 • Question 3 • Question 4 • Research • Teacher Responsible • Their Work • Three Big Ideas 	<p>Leadership</p> <ul style="list-style-type: none"> • Coaching Culture • Focus • Meeting • Model • Principal is Key • Reciprocal Accountability • Stay the Course
<p>Professional Development</p> <ul style="list-style-type: none"> • Art and Science • CCSS • Collaborative Relationship • Job-embedded • Journey • Learning • PD Drivers • PLC as PD • Share Ideas • Support • Train the Trainer 		<p>Set Aside:</p> <ul style="list-style-type: none"> • zChange in practice • zChanging teacher thinking • zLearning about PLCs • zReal PLC

Considering that the first four interviews were with people in district administration roles and the initial question was to talk about how they structured their PLCs and the processes for achieving that structure, it's not surprising that most of the codes fell under the District Structure category. This data became the basis of several cycles of axial and open coding. As I began to interrogate the relationships in the data to move into Axial Coding, I identified several questions and gaps in my understanding that would need to be filled out before I could move further toward Theory Generation. The next section describes the first round of theoretical sampling conducted as a result of the questions and gaps in understanding.

3.7.7.2. Theoretical Sampling that Informed Axial Coding

The seven concepts, identified during the open coding and analysis of the first four interviews, are listed below. I compared data along dimensional lines in order to identify gaps in understanding that created questions to be answered.

- Focus on Student Learning
- Community
- Leadership
- District Structures
- Framework
- Data
- Professional Development

The descriptions that follow demonstrate my initial foray into Axial Coding. As previously mentioned, Open and Axial Coding work together in the analysis process. The distinction between the two types of coding is primarily semantic. Both Glaser (1978) and Strauss and Corbin (1998) discuss the need to hypothesize relationships between the concepts (Glaser refers to it as a part of Open Coding) in order to determine where to obtain more data (theoretical sampling). I arrived at these summaries by writing about the category level concepts in terms of the relationships to and within their sub-categories. They represent what Glaser refers to as “conceptual elaborations of codes. (Barney G. Glaser, 1978, p. 37)”

Community: The category of community represents the sharing and trust that is created over time through working together toward the goal of focus on student learning.

Data: The category of data represents the requirement for accurate information about student progress to identify misconceptions in learning and to judge when student mastery has been attained.

District Structures: The category of district structures represents the physical, political, and hierarchical contexts for the community.

Focus on Student Learning: The category of focus on student learning represents the teacher's ability to change her focus from teaching to learning (Rick DuFour, 2003). This concept arose directly from PLC theory and literature. It was not a surprise in that I had specifically chosen to study PLCs.

Framework: The category of framework represents the specific activities that focus on student learning and create trust, unity, and learning.

Leadership: The category of leadership represents the ability to act as a change agent by creating a vision of the future that focuses on student learning.

Professional Development: The category of professional development represents formal and informal learning whose focus is student learning.

Using the same considerations identified in Theoretical Sampling (Section 3.5.3.1) and having hypothesized about the relationship between the sub-codes within each key conceptual category, I conducted 'relational and variational sampling' to look for "incidents that demonstrate dimensional range or variation of a concept and the relationships among concepts. (Strauss & Corbin, 1998, p. 210)" I needed to identify groups or sub-groups appropriate for the task and the theoretical purpose for the choices. (Barney G. Glaser & Holton, 2004)" In order to find these incidents, I identified the following factors:

- Questions and gaps in understanding raised during open and axial coding and analysis

- Appropriate sources to answer these questions and their theoretical purpose
- Appropriate instrument(s) for gathering the data needed to answer the questions
- Logistics of accessing the sources
- Two examples are provided below and are followed by a summary of the full analysis (Table 4).

3.7.7.2.1. Variational and relational questions by audience and category:

To begin theoretical sampling, I identified all of the questions and gaps in understanding that arose through the open coding and analysis process and that address variations in properties and dimensions. These questions and gaps in understanding were then grouped by source-type best able to answer the question and the high-level category (e.g. Framework, Professional Development, Leadership, etc.) to make the theoretical purpose clearer.

Variational questions for teachers about professional development, communities, and district structures:

As the theory began to emerge and center around the Focus on Student Learning category, I needed to understand the impact this concept had for the teachers' perceptions about professional development. Did the change in focus have as big an impact as I had hypothesized based on data gathered from school administration and leadership?

Additionally, I hypothesized that informal learning was just as important as formal learning. Therefore, I needed to grasp the teachers' range of experience with regard to the formal and informal aspects of the community's learning trajectory. For example, do teachers distinguish differing values of what they learn between formal and informal learning experiences?

The data initially indicated that the community took time to establish and that district structures played an important role in the development. I used the questions to understand the teachers' experience of the change from individual to community member, from teaching to student learning, and from professional development recipient to professional development participant. I also delved into the teacher's perceptions of the impact the district had on those changes.

Source and Instrument:

The questions about professional development, community, and district structures are about the teachers' lived experiences in existing, effective PLCs. Therefore, the emerging theory drives the requirement to return to these districts as the source of the data. I chose between four types of data gathering instruments as described in the Section 3.5.3.2. Individual interviews were conducted with teachers across all grade bands (elementary school, middle school, and high school) based on the following criteria:

- different lengths of tenure in the district
- teachers who have been with the district since before the PLC work began
- someone new to the district
- someone straight out of college and
- someone from another district altogether

Relational Questions:

Based on the categories identified and the descriptions given for those categories, the following diagram (Figure 21: PLC inputs, outputs, and context) emerged as a visual representation of the interaction between and among the categories. It provided a visual reference to identify relational questions of theoretical relevance.

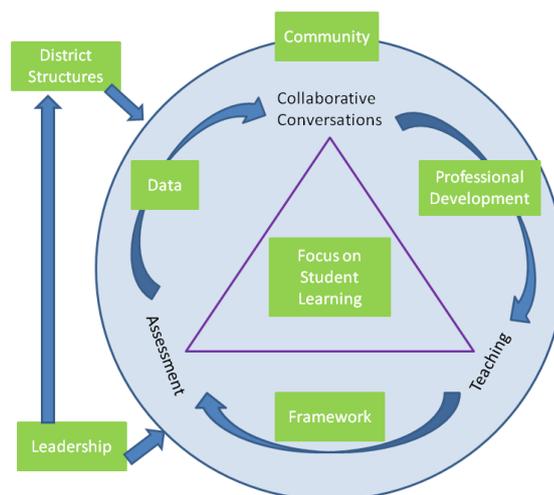


Figure 21: PLC inputs, outputs, and context

Since community is described as the context for the focus on student learning, professional development, framework, and data, I wondered what would happen to those concepts if the community was removed from the

equation. Additionally, what would be the impact on leadership’s ability to focus on student learning, if the community was not present to facilitate conversations among teachers?

Sources and Instruments:

These relationships were explored via interview with all of the sources identified in the variational question groups. Additionally, I sought out this type of data within the Data Team documents I reviewed.

3.7.7.2.2. Variational and Relational Questions Summary

It will be noted that the questions asked were not exhaustive, nor do they address the questions other researchers may have. However, in grounded theory research “the direction of new data collection is determined, not by *a priori* hypotheses, but by ongoing interpretation of data and emerging conceptual categories. (Roy Suddaby, 2006, p. 634)” These questions and their theoretically relevant sources provided the inputs to determine instruments needed for theoretical sampling that address relational and variational questions. The table below (Table 16: Theoretical Sampling Analysis) summarizes the discussion above.

Table 16: Theoretical Sampling Analysis

Question Group	Appropriate Source	Data Gathering Instrument	Theoretical Purposes
<i>For teachers about PD</i>	Teachers in existing districts	Interview	<ul style="list-style-type: none"> • Impact of Focus on Student Learning • Perceived differences between Formal vs. Informal Learning
<i>For teachers about community and district structures</i>	Teachers in existing districts	Interview, Observation	<ul style="list-style-type: none"> • Impact of District Structures on Community formation and sustaining
<i>For leaders or administrators about district structures and leadership</i>	<ul style="list-style-type: none"> • Principal in a school-only PLC • Existing district leaders and teachers 	<ul style="list-style-type: none"> • Interview • eMail, Interview 	<ul style="list-style-type: none"> • Impact of District Structures on a school-only PLC • Impact of School Board on District Structures
<i>For administrators about Framework and Non PLC</i>	HMH Data Team consultants and	Interview, Documents	<ul style="list-style-type: none"> • Additional data regarding Framework

Question Group	Appropriate Source	Data Gathering Instrument	Theoretical Purposes
<i>comparisons</i>	documents		
For administrators about Leadership	<ul style="list-style-type: none"> Existing District Leadership Principal at school-only PLC Rick DuFour 	Interview	<ul style="list-style-type: none"> Range of meaning of “bought into” for Leadership
Relational Questions	<ul style="list-style-type: none"> Teachers and leaders in existing districts Principal at school-only PLC Rick DuFour Data Team consultants 	Interview	<ul style="list-style-type: none"> Impact of Community on Focus on Student Learning, Professional Development, Framework, and Data

This sampling lead to the following eight interviews as follows (Table 17: First Theoretical Sampling Interviews):

Table 17: First Theoretical Sampling Interviews

Position	Interview Date	Interview Length	#Pages/Words
Grade 4 teacher	3/23/2015	35 minutes	8/4698
Grade 6 English teacher	4/03/2015	37 minutes	9/4846
Science teacher	4/06/2015	45 minutes	10/5942
Grade 4 teacher	4/06/2015	22 minutes	6/3001
Grade 1 teacher	4/13/2015	27 minutes	7/3506
English teacher	5/08/2015	30 minutes	7/3063
English teacher	5/29/2015	35 minutes	7/3645
School Only PLC	4/03/2015	42 minutes	11/6129
TOTAL	8	273 minutes	65/34,830

3.7.7.3. Axial Coding Stage

The interviews from the first round of theoretical sampling (Table 17: First Theoretical Sampling Interviews) were all transcribed and open coded.

Any new codes were added to the existing categories and were compared against existing concepts. “Theoretical sampling is, then, used as a way of checking on the emerging conceptual framework rather than being used for verification of preconceived hypothesis. (Barney G. Glaser, 1978, p. 39)” The list of key conceptual categories and their associated codes can be found in Section 3.7.7.1.2. This section explains how the theory began to emerge as the new data was compared to the existing data. The codes became sub-categories of the key conceptual categories with properties and dimensions. In addition, relationships between and within the sub-categories and properties began to emerge.

3.7.7.3.1. Initial Struggles

I struggled with the relational statement aspects of Axial Coding. At first, I thought the Three Big Ideas (Learning, Collaboration, and Results) from PLC literature were the categories within which I was to identify relationships. Figure 22: Axial Coding Operation Memo Example is the operational memo I wrote at the time. I created theoretical memos and diagrams to help me see the relationships. One example (Figure 23: Axial Coding Theoretical Memo Example #1) of this analysis involved relating Data concepts with Results.

Beginning to do Axial Coding 12/23/2014

It's time to start identifying categories with their properties and dimensions within my data. I'm scared!! But i still feel that the Three Big Ideas seem to be at the core of what I've heard from both District #2 and District #1. Now, in District #1, they explicitly use and discuss the Three Big Ideas as part of their evaluation process and coaching. District #2 doesn't seem to. I am going to look at the categories and their properties and dimensions on the continuum that Tim discusses. What are the two extremes of the concept?

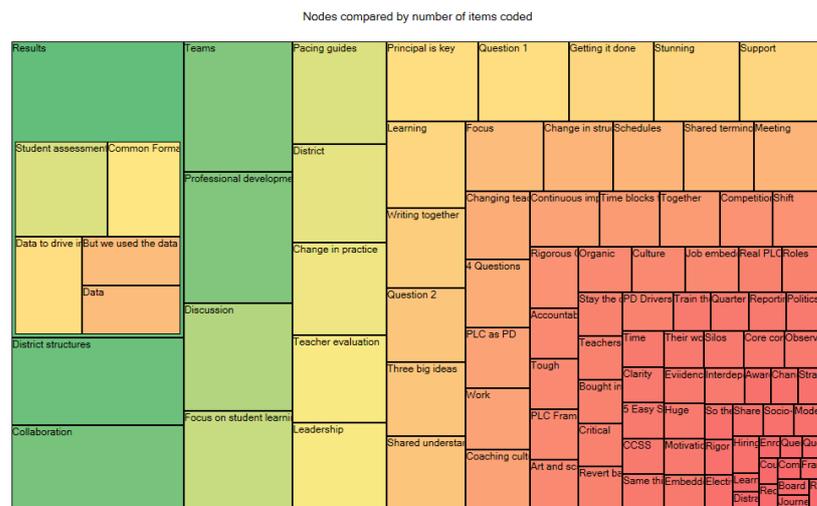
I started working on the Collaboration Category. I started a mind map. I picked some of the high scoring nodes from the Tree Map that related to collaboration. I then reviewed the coded passages and added notes and questions for these nodes:

Collaboration
Pacing Guides
Teams

Figure 22: Axial Coding Operation Memo Example

Results Axial Coding – first attempt 1/2/2015

After looking at the tree map of All of the nodes, I realized that there were some things that were associated with Results that I probably coded differently. I then made those things children of Results and aggregated the data. This is the new tree map:



Now that I think more about it, I wonder if the things I coded as children aren't actually properties and dimensions??? This is the part that confuses me so far. However, I will continue with my analysis in the same way I did the other two Big Ideas1 and see what happens.

Figure 23: Axial Coding Theoretical Memo Example #1

I eventually got out of this loop by reminding myself of the phenomenon I was trying to understand (teacher change in practice) and that PLC's Three Big Ideas may not play that big of a part in that change. This is what I wrote in an Operational Memo dated 1/3/2015: *“So I have concluded that, while the Three Big Ideas might play a key role in the structure of the community, they do not really help me understand this phenomenon of change in practice.”*

3.7.7.3.2. On the Right Path

The next step in my analysis was recorded in an operational memo wherein I wrote, *“My next task is to write narrative about each category*

and position it as input, output, and/or context. The goal is to help me get clear about whether these are the right categories (can they be abstracted) and to begin to understand their relationships to each other."

The narrative approach proved an effective and efficient analysis tool. As I worked through the input/output narratives, I returned to the data to ensure the concepts represented the data. Concept and theoretical memos helped to densify the categories and provide more detail about ranges of behavior. The memo below (Figure 24: Axial Coding Concept Memo Example) demonstrates a concept memo that helped add detail to the concept of community and the impact of the range of behavior along one property.

Community in the making? 5/30/2015

While coding Interview #8's interview, I keep coming back to two things. 1) the Science dept hasn't changed their Focus to student learning 2) their community isn't healthy and positive.

Lots of resistance to sharing and being open to change -- still focused on "my teaching" not how are my students learning. Even when Interview #8 mentions that School #2 teachers have become a community (in comparison with not wanting to know about what's happening at School #3) it's because they have justified why their students aren't going to learn.

He says: "Because even within our department we have different groups of students that we are working with. And we've all reached an understanding about that. We've identified. We understand the challenges that each one has."

Later he mentions that they are not able to answer Questions 3 and 4 because the assessments aren't formative, they are summative. As a result, there's no connection between the pacing guides and teaching methods.

When talking about teaching methods, he says, "It's not like these are data driven."

Figure 24: Axial Coding Concept Memo Example

Writing the input/output relationships confirmed the concepts represented the data and the patterns that were emerging. The next step, refining the lists and identifying sub-categories with properties and dimensions, took a couple of attempts to do. At first, I was using the sub-categories as the properties and then some of the other codes as properties and dimensions. However, once I realized that the subcategories were aspects of the category and the properties and dimensions provided the most



Figure 26: Axial Coding Mind Map Diagram Example

I was able to avoid forcing my data into *a priori* theories (e.g., The Three Big Ideas) by reflexively writing memos and reminding myself of the purpose of this study. However, the time spent thinking about The Three Big Ideas added to my theoretical sensitivity. Once I stepped back from that specific data, I was able to clearly see the generalizations and patterns emerging from my data as they related to professional development and change in teacher practice.

3.7.7.3.3. Adding Depth through Discoveries

Professional networks at Houghton Mifflin Harcourt (HMH) connected me with another coworker, in HMH's Professional Services group, who would be interested in the topic of this study. In discussing the purpose of my study and the community I had chosen to study (Professional Learning Communities), the coworker commented, "We created Data Teams at HMH. A district might call itself a PLC, but what they DO is Data Teams." This discovery that there is potentially another approach to the PLC structure had me looking into Data Teams via literature available on the HMH website.

I read three white papers written by members of HMH's Professional Services department. These white papers defined some district issues, explained HMH's role, provided intervention results, and reviewed some lessons learned. I added one of the papers to nVivo and open coded it.

Reading the three papers highlighted three key concepts related to my data:
 McDonald, Barbara

1) The interventions were mainly data-focused; 2) None of the papers mentioned aligning the curriculum, even though they mentioned creating common formative assessments; 3) Only one white paper mentioned teacher collaboration. Since the white papers were somewhat one-dimensional, I sought first-hand information about the functioning of Data Teams (see Table 18: Variational Question Sources). However, after contacting two districts from the white papers, the administrative staff that hired HMH to do the consulting work no longer worked in the district. The current staff was either not using Data Teams or would not speak to me about them. I also attempted to contact someone in Professional Services at HMH, but he did not return my email.

The discovery of Data Teams added depth and variation to the theoretical scheme. It reinforced the importance of the concept of data by adding a different context while using similar concepts such as common formative assessment and formats for teachers to discuss the results of the CFAs. Additionally, the researcher discovered that District #1 used Data Team forms and processes. This appeared in a theoretical memo (Figure 27: Axial Coding Theoretical Memo Example #2) as well. On the other hand, not being able to talk to districts or HMH employees about Data Teams, I was left with questions about the importance of a unified curriculum with pacing guides and the concept of collaboration.

Data - Properties and Dimensions 9/24/2015

What's missing from my MindMap?



An analysis process? Like the Data Teams theory has? These are the steps in the analysis for Data Teams:

- Step 1: Collect and chart data
- Step 2: Analyze data and prioritize needs
- Step 3: Establish SMART goals
- Step 4: Select instructional strategies
- Step 5: Determine results indicators
- Step 6: Monitor and evaluate results

These steps happen in a less structured way in a PLC. For example, the teachers all chart their CFA results, analyze the results and prioritize needs in the collaboration time (Data Team Meetings). They also select instructional strategies in those meetings, in that they group students based on the results of what they struggled with in the CFA and assign a teacher who has a strength in that concept. Step 3 and 5, are taken care by sticking to the standards being addressed in the instructional segment. To add this layer of complexity seems counter productive. Step 6 is accomplished via the cyclical nature of the action research process.

Action research seems to be a bit of a throw away concept in the info about PLCs on the website. Yet, it is the backbone of the effectiveness. The head is Focus on Student Learning and Action research is the spine. Hmm...

Figure 27: Axial Coding Theoretical Memo Example #2

Along with the discovery of Data Teams and the variation they provided, the memoing process exposed a discovery within the data. In the same memo that included a Data Team information comparison (Figure 28: Discover Memo #1), I realized that the data pointed to the implicit use of Action Research in PLC functioning. I had recently gone to the All Things PLC website and read their definition of a PLC:

Data Analysis through AR Lens 3/16/20

Teachers can do the action research process on their own with success. However, the success is somewhat limited to their classroom, because in this application, AR is an individual exercise. Additionally, a new approach may address most of the students' needs, but not all. There is no space in AR for ensuring ALL students learn, because the research is meant to address the teacher's teaching methods!.

The standard AR process is usually focused on teacher teaching. The PLC AR process is focused on student learning. As I was reflecting on how AR can be somewhat never ending, because there's always some new idea, some tweak, some adjustment to be made to the teaching method, I realized that the PLC AR process is only two, sometimes three, cycles per learning goal. The first cycle is planning for the initial learning (pacing guides and CFAs – questions 1 and 2), the second cycle is for remediation/extension (questions 3 and 4). If there's a need for another cycle, it's still on the same learning goal and, rather than being a revised plan, it's a new plan to address the learning needs of the students who need it.

Differentiators in standard AR implementation and PLC AR implementation = focus on student learning and community

Figure 28: Discover Memo #1

Professional learning community (PLC). An ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. Professional learning communities operate under the assumption that the key to improved learning for students is continuous job-embedded learning for educators. (Rebecca DuFour, n.d.)

After the Data – Properties and Dimensions memo (Figure 27: Axial Coding Theoretical Memo Example #2), I went back to my data and searched for the term “action research.” I found one instance of the use of the term “action research” in the data. However, when I reviewed several the interviews as a whole, I realized that many of the processes the districts use are based on Action Research. I added it as a code and then did some analysis of how it fit with the data.

I saw Action Research cycles clearly in descriptions of system change. That is, whenever someone would mention a change in how things were done, it was usually preceded with a description of planning for the change,

followed by implementing the change, an observation of how it went, and a review of what worked and what didn't work. For example, when adding an "academic extension" period at a middle school, School #1 followed an Action Research process to determine the best way to implement it. The principal described it like this:

And when we did this at first, it was a pilot. So when we first put the extra time and support period in there, we did it during the third quarter, in the winter/spring there. And we piloted it with the teachers. In the fourth quarter we took it away. And we surveyed staff, parents and students about pros and cons of such an approach. When we did that, when we took it away, the staff wanted it back immediately. We said no. We're going to do what we said we're going to do. Which is take this time to survey, figure out what we're going to do the following year. And at that time, at the end of the year, the teachers all voted to go ahead and move forward with that part of the piece in the contract, with a vote of 85% or more of the current teachers. Moving forward, it was more of a site-based piece. They went and ran with that.

I found these kinds of examples in nearly all the interviews. However, theoretical sensitivity was prompting me to look at how action research worked within the teaching process. This led me to create several diagrams and memos about those diagrams. There were two, key memos that changed a good deal of my thinking with regard to categories and subcategories. The first one (Figure 28: Discover Memo #1) created the realization that action research is usually used to change a teacher's methods of teaching, but the PLC version of action research is focused on student learning.

The second memo (Figure 29: Discovery Memo #2), wherein I diagrammed action research cycles by overlaying codes from the data, included a change in thinking about the relative importance of the category “framework”.

Framework has pretty much come to mean the 4 Critical Questions, Pacing Guides, and CFAs. And aren't these properties of Focusing on Student Learning? The extent to which the questions, guides, and CFAs are implemented are indicative of the level of student focus. When I think about what Teacher #8 said, because they couldn't make the CFAs actually formative and then act on them, stalled the formation of the community as well as the ability to ensure students learned.

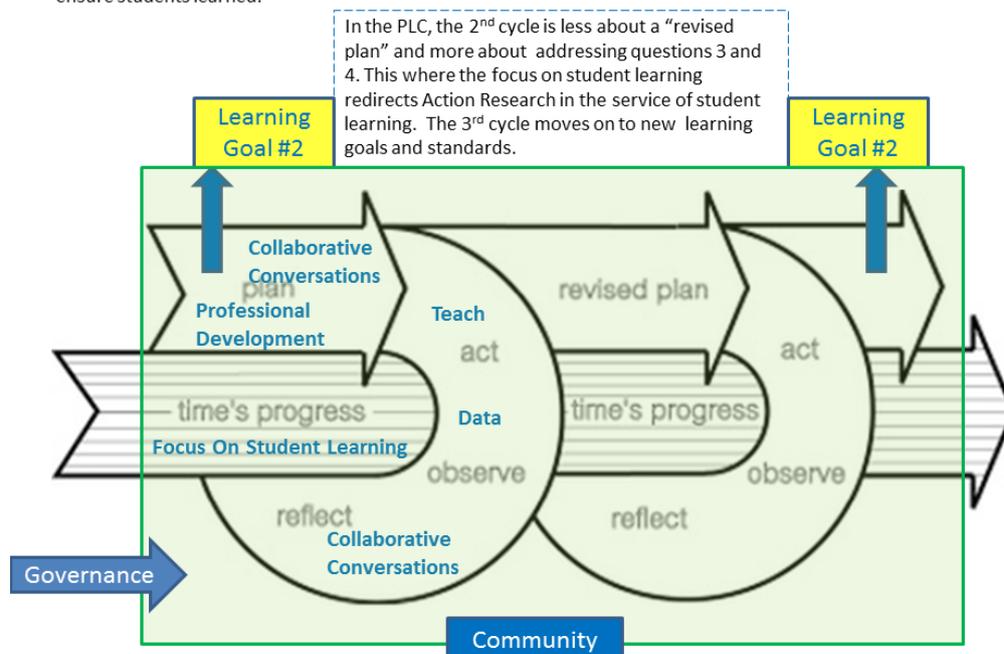


Figure 29: Discovery Memo #2

Axial coding of the main categories was completed after a great deal of memo writing that required returning to the data many times (the results can be found in Chapter 4: Open and Axial Coding). I also realized that I had begun Selective Coding. For example, in Discovery Memo #2, I decided “framework” was really part of “focus on student learning” and reworked the Axial Coding to reflect that. The relational statements were beginning to point to a theoretical scheme, but there were still questions to be answered and variation to discover.

3.7.7.4. Theoretical Sampling that Informed Selective Coding

I had a grasp of the scope of the data and its emerging patterns through writing narratives about the categories and the relationships within and between the sub-categories, properties, and dimensions. However, the

analysis that led to these discoveries also identified gaps in understanding that drove the next round of theoretical sampling. Having used the same criteria for determining theoretical purpose and sources as in Section 3.7.7.2, I have provided 2 examples of the analysis that drove theoretical sampling at this stage of the research. Table 19: Theoretical Sampling Analysis summarizes the full analysis.

3.7.7.4.1. Variational and relational questions by audience and category:

Variational questions for teachers about community and framework:

The white papers from Houghton Mifflin Harcourt were high level descriptions of the work that Houghton Mifflin Harcourt did with the school districts. It does not address the interpersonal or community aspects of how data is created, interpreted, and acted upon. Therefore, the concept that a district or school may call itself a PLC but what it does is Data Team needs to be further explored, because PLCs have a very clear framework and community plays a critical role in mediating the framework.

Sources and Instruments to Address Variational Questions:

The theoretical purpose of these questions led me to interview administration and teachers in at least one Data Team district and one PLC District (see Table 18: Variational Question Sources). As a backup, I attempted to speak with a consultant from HMH’s Professional Services Group.

Table 18: Variational Question Sources

PLC Districts	Data Team Districts	HMH Professional Services
District #1	White Paper District #1	Employee #1
District #2	White Paper District #2	
	White Paper District #3	

Relational Questions:

Some questions that arose via memo-writing included:

How does action research fit into the emerging theory? Is governance a better term to conceptualize what is happening in the District Structures category? Is Leadership a function of governance? Is Focus on Student Learning a function of governance?

Sources and Instruments:

These relationship questions were explored via further analysis of the processes and structures inherent in the key concepts.

3.7.7.4.2. Variational and Relational Questions Summary

It will be noted that the questions asked were not exhaustive, nor do they address the questions other researchers may have. However, in grounded theory research “the direction of new data collection is determined, not by a priori hypotheses, but by ongoing interpretation of data and emerging conceptual categories (Suddaby, 2006, p. 634).” These questions and their theoretically relevant sources provided the inputs to determine instruments needed for theoretical sampling that address relational and variational questions. The table below (Table 19: Theoretical Sampling Analysis) summarizes the discussion above.

Table 19: Theoretical Sampling Analysis

Question Group	Appropriate Source	Data Gathering Instrument	Theoretical Purposes
Variational Questions	<ul style="list-style-type: none"> • Elkhart, IN or • Aurora West, IL • Floyd County New Albany, IN • Kildeer Countryside, IL • West Middle School, MI 	Interview district administrators and teacher leaders	<ul style="list-style-type: none"> • To better understand the role of Action Research – is it used implicitly or explicitly? • To better understand the conversation drivers. • To assess the impact of the community aspect on sustaining the framework
Relational Questions	Further analysis of process and structure of the key categories.	Diagrams and mindmaps demonstrating relationships within and between key categories	To assist in identifying the storyline of the emerging theory.

3.7.8. Stage 4: Theory Generation

The interviews I was able to conduct from the second round of theoretical sampling were all transcribed and open coded. Any new codes were added to the existing categories and were compared against existing

concepts. This section explains how I moved from Axial Coding to Theory Generation via Selective Coding.

3.7.8.1. Selective Coding Stage

Grounded theory coding processes are best described as epicycles that move through three types of coding – open, axial, and selective. As a theory that addresses the phenomenon under study emerges, the researcher moves from generating codes and identifying their properties and dimensions, to systematically developing key categories and linking them to sub-categories, to integrating and refining the categories and sub-categories as the theory emerges (Strauss & Corbin, 1998). This section describes my process of moving from axial coding to selective coding to theory generation.

The Selective Coding process was driven by the Axial Coding Paradigm that Strauss and Corbin (1998, p. 127) describe as an analytic tool that assists in integrating structure and process into the emerging theoretical scheme. That is, relating the concepts in terms of process conditions that trigger or impact the actions and interactions of the people and the outcomes of those actions and interactions as a result. I documented the struggle I had grasping The Paradigm in a series of three operational memos. In the first memo (Figure 30: Axial Coding Operational Memo - Struggle), I pointed out that I was just stringing the together a description of the category with its subcategories, properties and dimensions, but not really explaining the range of interactions and the outcomes. The second memo (Figure 31: Axial Coding Operational Memo Example) documented a conversation I had with my PhD

Axial Coding and Analysis 1/18/2016

I'm finding it difficult to think deeply about my codes. I've done PD and Data descriptions and mostly just strung the codes together. Just couldn't think more deeply about them than that. Moved on to Leadership (and changed locations) and found that I was able to think more deeply about the codes and provide more contextual understanding of them as they relate to the community of practice under study.

Figure 30: Axial Coding Operational Memo - Struggle

Supervisor that helped me move on.

These memos demonstrate the analytic gestalt that Strauss and Corbin (1998) mention. It all served to ensure I was appropriately immersed in the data to allow a theory to emerge. Eventually, I was able to produce a thorough explanation of the categories, subcategories and the relationships of their properties and dimensions were defined.

Axial Coding and Analysis Part 2 2/13/2016

I talked with Tim on Thursday about my struggles. I said that I was going to try to do the Categories I was passionate about now and leave the other ones that I was struggling with alone for a little bit. He reminded me that this is part of the analysis process. If I am struggling to make sense of the category myself, perhaps I need to look at it again in the light of whether or not it really supports my emerging theory. It is still all right to eliminate a category or rearrange it into another category (like I did with Framework).

I think I will try to draw some more models to see how they fit (or don't) -- the two I'm struggling with are PD and Data. But that will be for another day (or later today) because I am pooped right now.

Figure 31: Axial Coding Operational Memo Example

At this point, I began to memo and diagram the relationships. The purpose of this analysis was to understand where the processes and structures lay within the PLC in order to understand the category relationships and determine whether there was a single, unifying category. Since the districts under study functioned as well-established PLCs, but the data all spoke of the journey to become a well-established PLC, I could not point to a specific set of processes and structures that explained the whole. One category was never able to represent the phenomenon with analytic power such that the rest of the categories fit together to form an explanatory whole. In a very long memo, "Trying to get the theory to emerge (12/5/2015)," I first started thinking about the phases the PLC went through in order to function so well.

In an excerpt from the memo (Figure 32: Selective Coding Theoretical Memo), I restated purpose of the study to put my thoughts in the perspective of the initial research phenomenon. Italicized text indicated the initial study purpose while orange text represented the researcher's conclusions reached through open and axial coding analysis. This memo was the first time I had clearly articulated a key category as "Community of Practice Focused on Student Learning."

I had concluded that a central concept in the theory was “Community of Practice Focused on Student Learning” based on a deep dive into the data and my theoretical sensitivity around communities of practice. In another excerpt (Figure 33: Selective Coding Theoretical Memo #2) from the “Trying to get the theory to emerge memo” I wrote about the process of the changes that concluded with the three phases. Even though I only discuss the first two phases in the memo, I still wrote the 3rd change as it was the merging of the

<edited for space>

The focus is on how existing communities (specifically, Professional Learning Communities) in the United States create and sustain change in teacher practice.

Change 1: Focus on Student Learning

Change 2: Form Community of Practice

Change 3: Maintain a Community of Practice Focused on Student Learning

Figure 33: Selective Coding Theoretical Memo

Are there two levels of change? First, the District Change and then the individual Teacher Change? The teacher change is dependent on the district change, yes.

Districts often take several years to make the change of focus to student learning and implementing the structures to answer The Four Critical Questions. District #1 took 2-3 years to get the elementary schools working as a CoP and filtered that up to the High School in waves. District #2 also took about 4 years. Granted, they were on the journey with Rick DuFour at Adelai Stevenson HS. It is during this beginning of the change that Leadership brings in Professional Development to help the community to understand the goal of the change and how they are going to change the ship’s direction. It really reminds me of steering a sailing ship at sea. Bringing down this sail and hoisting that one so you can catch the wind in the right way. Sounds simple, but the effort is enormous, and takes many people synchronizing their efforts.

Once the community is beginning to form (evidenced by creating an environment where they can answer The Four Critical Questions) that’s when you see the changes in individual teacher practice begin to emerge. Is actually functioning as a CoP a change in practice? In a way it is, because before this, they are “solo players” and so it’s a change in how they teach that they now consult with each other about how their kids are doing and rely on each other to remediate/enrich. <Etienne also talks about learning and changing being somewhat synonymous in a community of practice – pg 95 – Learning in Practice (Learning Meaning Identity)>

Figure 32: Selective Coding Theoretical Memo #2

first two. The phase aspect first came about when thinking about individual teacher change in practice, because I realized that system change needs to precede individual teacher change. The system is always driving the way teachers teach, regardless of the focus.

This writing led to a visual representation (Figure 34: Selective Coding Diagram) of my thinking that was quite powerful in moving to theory.

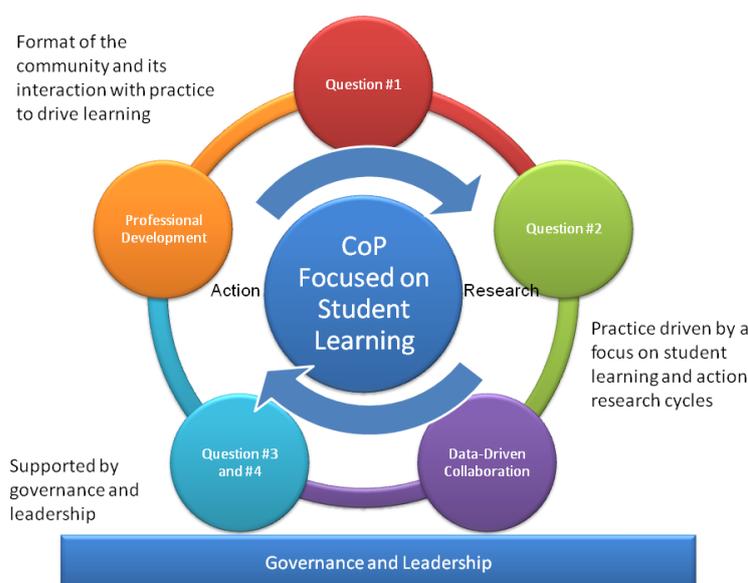


Figure 34: Selective Coding Diagram

In order to step back from the detail of all of the Axial Coding I had been doing for months, I decided to write the journey (Figure 35: Selective Coding Operational Memo #2) of the emerging theory up to the selective coding I had already done. As stated in this memo, understanding that I had been on a journey and that all of the thinking, writing, and diagramming had produced results gave me hope that I would complete the journey.

The additional abstraction of writing the theoretical journey helped me look at the data with fresh eyes. I began to write the storyline of the theoretical scheme based on the Three Phases of Change.

Selective Coding 5/14/2016

Writing my journey to selective coding has been really powerful. Not least of which because it made me realize I hadn't described and axial coded the professional development category. But more powerfully, to see the emergence of my thinking as I worked to compare my data in multiple ways.

This was my first description of the category

Professional Development: The category of **professional development** represents formal and informal *learning* whose **focus is student learning**.

This is what it means to me today

Professional Development: The category of **professional development** represents the learning journey teachers travel as they change from being a district of individual teachers to a community of practice focused on student learning.

The initial concept was quite rudimentary, while the current one reflects the depth of the thinking, comparing, and analyzing what the concept means based on the data gathered.

Figure 35: Selective Coding Operational Memo #2

3.7.8.2. Emerging Theory

The idea of a series of changes answered the two-part statement about creating and sustaining teacher change that is the purpose of the research by identifying the aspects that created the change as compared to the aspects that sustained the change. This allowed the theory to emerge in a series of conclusions about:

1. The use of sub-categories, as opposed to key categories, as the basis of relationship comparisons
2. How sub-categories fit into each phase
3. How causal/conditional relationships of the subcategories fit into each phase.
4. How relationships of the sub-categories changed as the PLC moved from its pre-PLC state through its end state of a community of practice focused on student learning

Theoretical sensitivity and the purpose of the research prompted me to look at this progression for the key category “professional development” first.

Since the theoretical scheme consisted of three phases, as opposed to one central category around which the key categories can be understood as a whole, I used Strauss and Corbin’s (1998) Axial Coding Paradigm (see Section 3.5.4.2) to “order data in such a way that structure and process are integrated (Strauss & Corbin, 1998, p. 128).” I borrowed a visual representation (Figure 36: Strauss & Corbin’s (1998) Axial Coding Paradigm) of the general framework of the paradigm from my PhD Supervisor’s Thesis (Savage, 2015). This visualization starts with a causal condition on the left that supports the actions and interactions in the middle that lead to the consequence on the right. It also indicates that there are contextual conditions and intervening conditions impacting the actions and interactions.

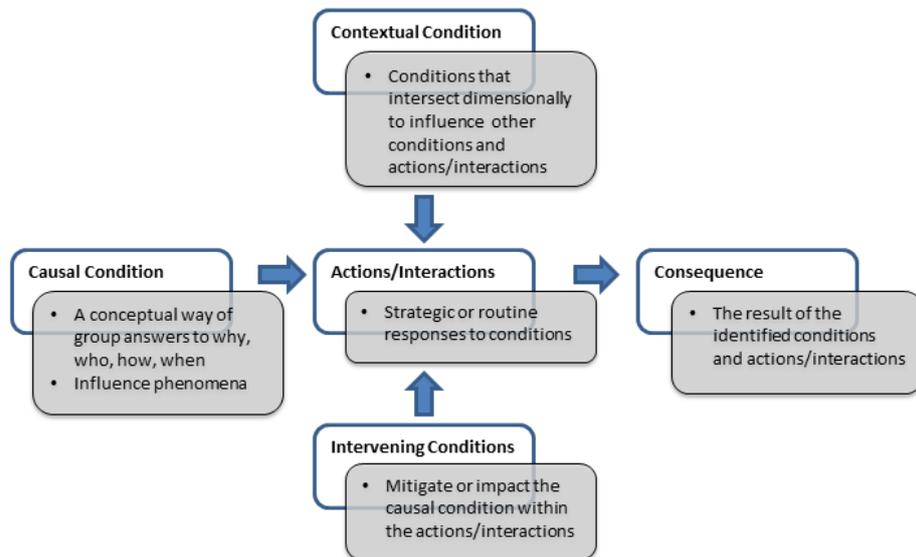


Figure 36: Strauss & Corbin’s (1998) Axial Coding Paradigm

When considered in the context of the Axial Coding Paradigm, the key category of “professional development” could clearly be seen as the causal condition for the change, since the purpose of professional development is to cause change (Figure 37: Initial Axial Coding Paradigm Layout). This discovery prompted me to look at the other categories and determine whether they might fit into the axial coding paradigm as well. The initial diagram looked like this:

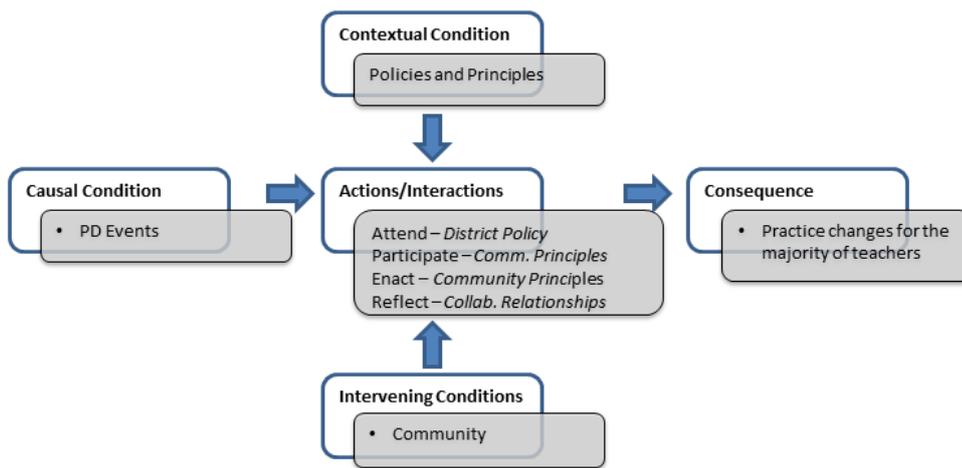


Figure 37: Initial Axial Coding Paradigm Layout

This, however, did not help me see the key category clearly at all. Nor was I able to rearrange the categories into other configurations based on the phases of change. My Supervisor suggested I look at how the subcategories fit into the axial coding paradigm by phase. Using the sub-categories as the basis of connecting the relationships yielded a much more productive analysis of the process and structure of the PLC development and a clearer explanation of the relationships between the subcategories and their properties and dimensions. I created a memo (Figure 38: Emerging Theory Operational Memo) about this discovery and have provided the summary

Turning point in my process 9/24/2016
 When I started thinking in terms of Phases, then the subcategories made sense, because some of them had to take place before others in the same main category. When I started diagramming the relationships of the subcategories via phases, they all fell into place without any forcing. Similar to doing a puzzle and creating the frame first, then all of the pieces have a boundary to fit in versus trying to figure out the picture from little snippets and shapes of pieces and working from inside out.

Figure 38: Emerging Theory Operational Memo

portion of the memo below.

Next, I identified how the subcategories for professional development fit into each phase. (Table 20: Professional Development Subcategories and Phases of Change. The sub-categories of “PD to Develop PLC” and “Drivers” mapped to changing the focus from teaching to learning, because these were the professional development activities the created the change. The subcategory of “Collaborative Relationships” mapped to forming the McDonald, Barbara

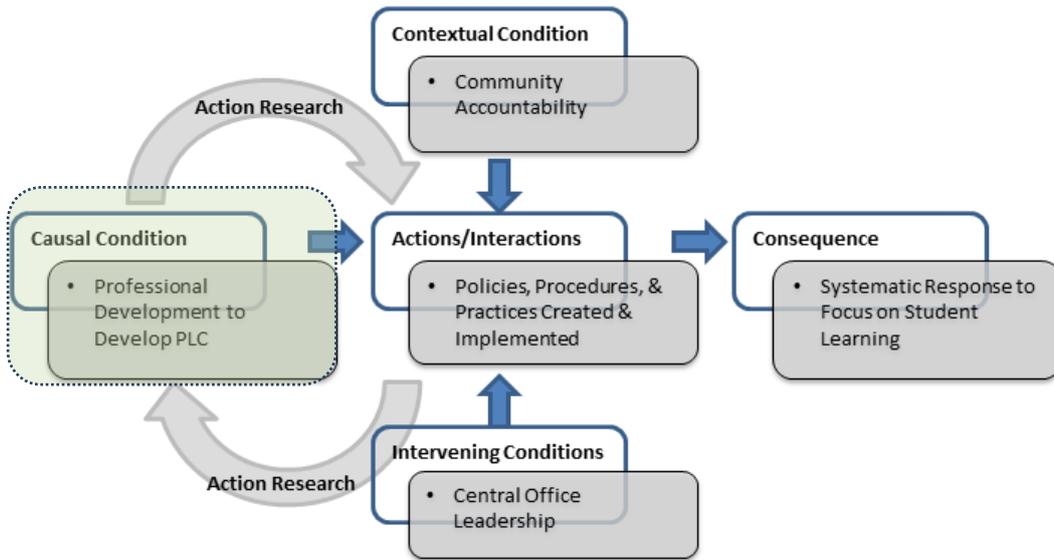
community of practice, because the collaborative relationships of the forming community of practice was professional development as well. Job-embedded learning from each other provides the majority of the professional development once the community of practice focused on student learning is fully developed.

Table 20: Professional Development Subcategories and Phases of Change

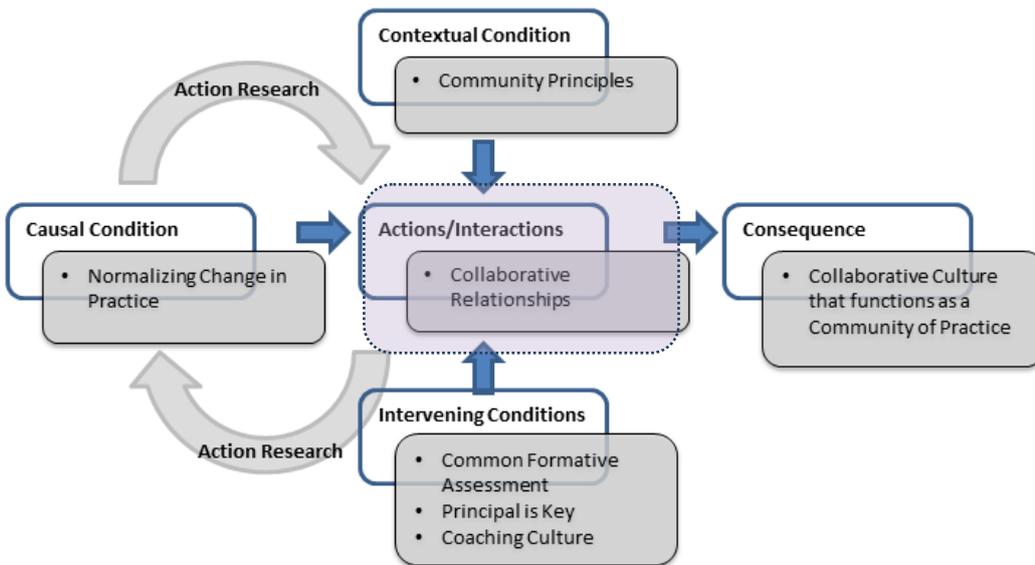
Professional Development Subcategories	Phases of Change
PD to Develop PLC	Change 1: Focus on Student Learning
Drivers	
Collaborative Relationships	Change 2: Form Community of Practice
Job-embedded	Change 3: Community of Practice Focused on Student Learning
Learning from Each Other	

The last two steps of the theoretical scheme emerging happened simultaneously by mapping the subcategories into the layout in Figure 36: Strauss & Corbin's (1998) Axial Coding Paradigm. Each sub-category fit in a different place in each phase of the change. This is demonstrated in the axial coding paradigm diagrams for the phases (Figure 39: Professional Development through Three Phases of Change) shown below. The highlight shows the progression of the function of professional development within the axial coding paradigm through the Phases. I saw similar progressions for each of the categories and subcategories and these diagrams became the basis of the theoretical scheme and enabled me to write the storyline of the theory (see Chapter 5: Selective Coding and Theory Generation).

Phase 1:



Phase 2:



Phase 3:

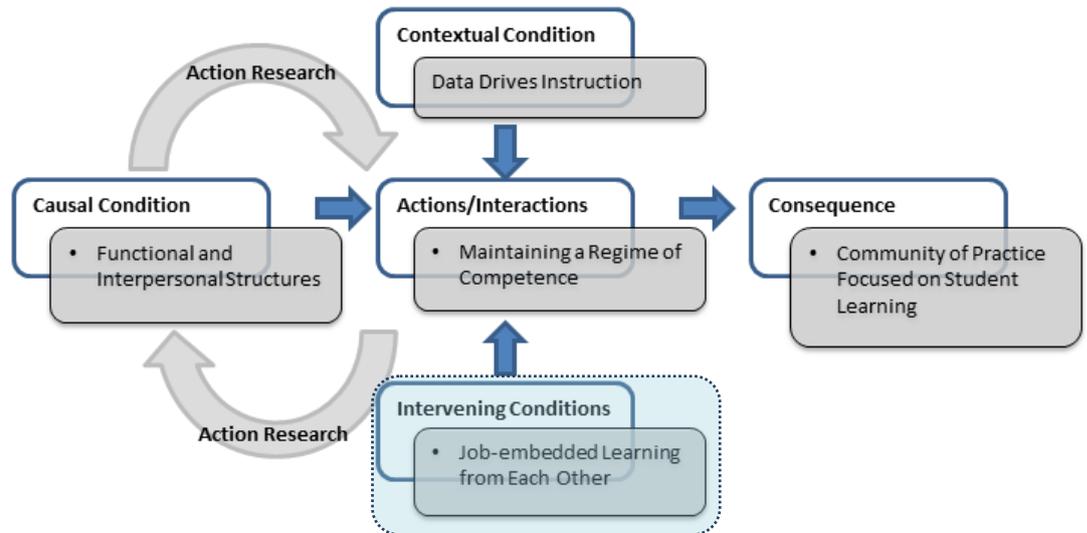


Figure 39: Professional Development through Three Phases of Change

This progression meant that the central category for each phase became the consequence of the phase. That is the emerging theory had three different central categories—one for each phase—with a new concept as the last central category. The main property of the category was the critical sub-category for that phase. In each phase, the rest of the sub-categories became part of the supporting concepts for the central category/consequence. This is far from a typical grounded theory, but it was what my theoretical sensitivity identified.

3.7.8.3. Refining the Theory

3.7.8.3.1. Internal Consistency

I began refining the theory by checking the internal consistency of the theoretical scheme. I read through it and made sure I had explained each aspect of the diagrams and how they related to each other. I then showed the diagrams to friends and colleagues and talked them through the progression within a diagram and from phase to phase. Glaser and Strauss (1967) state that a good, substantive theory is able to be understood by the lay person. In some cases, when the theory was not clear to the lay people I shared it with, I updated the storyline to ensure clarity.

3.7.8.3.2. Choosing what to keep and what to leave out

Choosing what to keep in and what to leave out became mostly a process of renaming concepts. Through the process of refining the theory storyline, the causal condition of Phase 2 was renamed '*normalizing change in practice*' (from change in practice). I made this change as it represented the causal condition more clearly while still relating to the properties and dimensions of the subcategory. This was confirmed through member validation (see below).

Other changes were made in Phase 3 of the theoretical scheme. During Axial coding I changed "District Structures" to Policies and Principles as the category for the subcategories of District Policies and Community Principles. However, it did not convey the appropriate concept either. During the member validation process (below), one of the participants also raised concerns about the Policies and Principles category as well as the District Policies subcategory. The participant said the District Policies has a very specific meaning that only includes Board of Education mandates. When the participant talks about the concept she includes 'procedures' and 'practices': 'policies, procedures, and practices.' This proved to be an apt conceptual container as the researcher compared it to the data and it was adopted as the subcategory identifier. However, that still left the researcher with the need to identify a category concept that would incorporate both subcategories. In a concept memo (Figure 40: Selective Coding Concept Memo), I considered how the two subcategories related to each other and the rest of the categories and subcategories. I determined that the two subcategories represented the

Struggling with Categories 11/12/2016

Policies, Procedures, and Practices and Community Principles represent something bigger. What is it?!

it's the idea of the structures of function and interpersonal. The policy, procedural, and practice structures that make the space for the community to form and the community principles to develop.

what's that first space called???

the second one could be 'norms'. what's the structural parallel?

What about Functional and People Structures?

Policies, Procedures, and Practices are Functional Structures
while

Community Principles are Interpersonal Structures

YES! Functional and Interpersonal Structures!!

Figure 40: Selective Coding Concept Memo

Functional and Interpersonal Structures of the community.

The last change that occurred (while writing the theory storyline) involved the concept of 'constantly improving the process of teaching.' As the community of practice was developed in Phase 2, maintaining a regime of competence more accurately reflected the actions/interactions of Phase 3, and the concept of 'competence' is particularly important when considering that sustaining the change in practice depends entirely on the community of practice defining competent practice.

3.7.8.3.3. Member validation

As mentioned above, another step I took to refine the theory was to validate it with members of the study. I produced an introduction and a summary of the relationships associated with each phase diagram. I then provided the summary to seven participants in District #1, the Superintendent of District #2, and the Principal at School #1. I was able to speak with one administrator and one teacher from District #1 as well as the Superintendent of District #2, and the Principal at School #1. The interviews were recorded, but not transcribed. I took notes with each interview. As mentioned above, the feedback impacted some of the coding. Overall, the feedback was positive.

The Superintendent for District #2 consults with other districts about implementing PLCs. She had studied the summary I provided and our conversation impacted an update to the theory that involved the relationship between Pacing Guides based on a common understanding of the standards and Common Formative Assessments. That is, she reinforced that these things are developed as part of Phase 1, Data intervenes in the community's learning in Phase 2, and Data is the context for maintaining the regime of competence in Phase 3. Part of the theoretical memo I wrote after our interview provided the guidance for me to write those processes accurately: *"She said that this was critical, because the power of the PLC is when you actually start using the CFA data -- which is also what I thought and why I placed it where I did. However, she said that the power wouldn't emerge unless the district had done the work ahead of time to understand the standards, unpack them into the Pacing Guide, and create CFAs that would measure the standards. She said that happens in Phase 1."*

The Superintendent of District #2 is a well-known speaker and author on PLCs. As we wrapped up our conversation about the theory, she said that McDonald, Barbara

I should use my theory as the framework for a book on developing and sustaining PLCs. This provided personal validation that all of the work and time I have spent developing the theory has provided something that someone in the field finds useful.

3.7.8.3.4. Building Variation

Variation in the theory happened primarily through the process of Open, Axial, and Selective coding and the rounds of theoretical sampling that facilitated the transformation of raw data to patterns and generalizations and then to relationships that identified structure and process. I also returned to the data, after the theory was drafted, and re-read memos comparing them to the theory. I looked for any variation that I had missed while writing the story, but found little to add.

3.8. The Role of Theoretical Sensitivity in the Analysis Process

Theoretical sensitivity is the ability to objectively use what one already knows (sometimes obtained through literature review) to connect data at the conceptual level. It is also achieved and refined through emersion in the data through constant comparison of concept to concept (Barney G. Glaser, 1978; Strauss & Corbin, 1998). “The essential relationship between data and theory is a conceptual code. The code conceptualizes the underlying pattern of a set of empirical indicators within the data. (Barney G. Glaser, 1978, p. 55)” This section will highlight some examples of the role theoretical sensitivity played in the emerging theory.

3.8.1. Theoretical Sensitivity During Open Coding

During open coding, theoretical sensitivity is used when deciding what the various passages mean in order to code them with a concept. It is also used when one begins to identify patterns of relationship among the conceptual codes.

As a novice grounded theory researcher, I was initially nervous about putting my own labels on concepts. I only got more comfortable with that skill as I neared the end of data gathering. Therefore, most of the codes created

while open coding are *in vivo* codes. As mentioned in the following sections, some of those codes were changed as the theory emerged.

There is almost no way to avoid using theoretical sensitivity when beginning to identify patterns of relationships among the conceptual codes. The concepts identified as key and the relationship of the rest of the concepts to those key concepts emerged as the result of my emersion in the data (Figure 41: Developing Key Categories).

Key Categories and their Properties and Dimensions -- 11/16/2015

The more I look at what I created for District Structures in the Excel spreadsheet, the more I realize that those things are contained in the Governance version. The mind maps I had created were essentially breaking the key categories into a few properties and then identifying the dimensions of those properties. Kind of gratifying to know that I did that subconsciously. I suspect that's what Glaser gets at with his insistence that constant comparison is all that's needed.

Figure 41: Developing Key Categories

3.8.2. Theoretical Sensitivity During Axial Coding

During axial coding, theoretical sensitivity is used to begin identifying relational patterns and key categories that emerge from the data. Theoretical sensitivity also aids the researcher in identifying the codes that are subcategories and/or properties of the subcategories. As the researcher begins to write out the relationships of the codes in order to describe the category, theoretical sensitivity and a deep familiarity with the data allow the researcher to begin making conceptual sense of the data as the theory begins to emerge.

As I worked through the Axial Coding process and sorted and re-sorted data concepts and their associated conceptual memos, the concept of Action Research rose to importance when thinking about the relationships of the concepts and their processes within Focusing on Student Learning (see also Section 3.7.7.3.3). The concept arose in an *in vivo* code from one of my last interviews:

It doesn't matter what background or what job you have in the school, whether it's the Principal, Teacher, Admin Assistant, Counselor, it's the entire group of
McDonald, Barbara

*educators there that are very committed to working as a team in a collaborative nature. Along with looking at best practice **action research** with the big focus on student learning.*

It was then that I realized I had been hearing action research processes broadly described, but the interviewees were not using the term. I included this query in my next round of theoretical sampling and, through more data comparison, proceeded to identify two ways PLCs use action research: 1) Individual;) System. The individual use of action research was discovered while using the action research framework to understand The Four Critical Questions. The system use of action research was confirmed in the subsequent theoretical sampling as well as through a review of the interview data.

Another example of theoretical sensitivity during axial coding happened when I was writing the description of Professional Development and describing the way the sub-categories and their properties supported the concept of Professional Development. The concepts of 'drives the purpose' and 'making sense' seemed to be dimensions of another concept that had yet to be named. The concept was also a property of the sub-category 'job-embedded'. I decided that 'drives the purpose' and 'making sense' were dimensions of the concept of direction such that they were elements of the concept that would drive the direction of the job-embedded professional development.

3.8.3. Theoretical Sensitivity During Selective Coding

During selective coding, theoretical sensitivity allows the researcher even more conceptual distance from the empirical indicators in the data in order to begin selecting and organizing the data into a theoretical schema from which a theory arises. It is at this point that the researcher begins (via memos) to tease out their own labels for concepts and determines to eliminate some codes. Strauss and Corbin recommend that the researcher identify his/her own codes because, "We prefer that students be more creative, that they provide their own names for what is going on and then describe their conceptualizations in terms of the particular properties and dimensions that were evident in their data. (1998, p. 155)"

I applied my own names for describing several concepts during the Selective Coding phase of the grounded theory process. One such time was in using the term “Shared Meaning” as the property of “Creating Knowledge” that happens within the community. While the phrase ‘shared meaning’ did not appear *in vivo* in the data, I used this term to name what was happening as the members of the community build shared terminology and understanding and share ideas with each other. That is, these concepts (shared terminology, shared understanding, and shared ideas) are dimensions of creating shared meaning.

While writing up the narrative of the theory, the concept of the code “entire school collaborative” within the Focus on Student learning category represented an issue in the fit of the emerging theory. As this concept was identified through theoretical sampling in which the data came from a Principal of a school that was only one in the district to have PLCs, the concept (as labeled) did not fit with the rest of the narrative. Therefore, I changed ‘school’ to ‘district’.

3.8.4. Theoretical Sensitivity During Theory Emergence

During theory emergence, theoretical sensitivity is the way the researcher identifies the core, theoretical category (or categories) around which the rest of the concepts revolve. “The goal of grounded theory is generate a theory that accounts for a pattern of behavior which is relevant and problematic for those involved.(Barney G. Glaser, 1978, p. 93)” The core category is a few words or a phrase that seem to explain what the research is about. “Another researcher, coming from a different theoretical orientation and having another research question, might arrive at quite another interpretation.(Strauss & Corbin, 1998, p. 146)”

As the theory began to emerge, the category of Professional Development underwent a few, significant changes. As I realized that there were three phases to the development and sustaining of the PLC, it became clear that PD to create a PLC was a critical subcategory and that it was driven by DuFour, Eaker, and Many’s definition of the goals of the PLCs. Therefore, I eliminated the category of “Drivers” and added Driver as a property of the PD to create a PLC.

3.9. Reflection on the Grounded Theory

Approach

I am pleased that I conducted a grounded theory study. It met my intellectual needs for looking for patterns and seeing the big picture. Heath and Cowley (2004, p. 149) stated it well when they said, "It is worth bearing in mind that qualitative analysis is a cognitive process and that each individual has a different cognitive style...It is wise to remember, too, that the aim is not to discover the theory, but a theory that aids understanding and action in the area under investigation."

3.10. Summary

This chapter included a discussion of the methodological requirements of grounded theory as well as an explanation of the analytical process used to choose grounded theory. Differences between the inductive process of grounded theory and the deductive processes of hypothetico-deductive research were discussed in the context of determining the version of grounded theory (Classic vs. Strauss and Corbin). The grounded theory methodology was analyzed via current literature, and then the research process was described in four stages. This was followed by a narrative demonstration of how the researcher accomplished the four stages and the role theoretical sensitivity played in each coding phase. All of this was done in order to ensure confirmability, auditability, and internal consistency (Gasson, 2004).

Chapter 4: Open and Axial Coding

This Chapter provides the detailed results of the Open and Axial Coding process described in the narrative Section 3.7.7. In this chapter is found:

- Key Categories, sub-categories, properties and dimensions that resulted from Open and Axial Coding. These are presented in a table that includes the number of times the code was referenced and the number of different sources for those references.
- The table is followed by a description of the codes and their relationships within the Key Category.
- A description of the relationships between categories
- Reflection on interpretation and the making of meaning
- Discussion of how this impacted the emerging theory
- Conclusions

4.1. Open and Axial Coding of Categories

The process for Open and Axial Coding described in Section 3.4 and the narrative (see Section 3.6) of the actual process the researcher used, led to creating tables of the key categories with a column for sub-categories, a column for properties of those sub-categories, and a column of the dimensions of those properties.

During the final review of the data, the researcher identified the number of references for each code within a table and the number of different sources for those references. Within the tables, each code had at least one reference from one source. Those that didn't were deleted. Those numbers were rolled up from Dimension to Property to Subcategory, because the concepts were all related within the data.

While the tables that precede the description contain counts of references and sources, these numbers did not influence the researcher's decisions about the key categories and the relationship of the rest of the concepts to those categories. As Strauss and Corbin (1998) point out, while grounded theory is considered a qualitative research methodology, it is not

one that uses coding to quantify data. Rather Strauss and Corbin (1998, p. 11) describe the grounded theory method of qualitative research as, “a nonmathematical process of interpretation, carried out for the purpose of discovering concepts and relationships in raw data and then organizing these into a theoretical explanatory scheme.”

The number of references for any given code might imply a level of strength in the subcategories and properties. However, as frequently happens with grounded theory, many of the properties and dimensions (and possibly a sub-category or two) arose through subsequent rounds of theoretical sampling whose goal was to identify variations and relationships within the emerging subcategories and properties. Therefore, a concept that is important for making the connections to the process or structure emerging in the theoretical schema may only be referenced once or twice. However, as will be noted for many of the sub-category concepts, the number of references seem to be indicative of their relative importance in the emerging theoretical schema. Since the number of references data was added after the theory emerged, they serve to add weight to the researcher’s decision to arrange the concepts into the final theoretical schema. Some of the ways the numbers enhanced the final theoretical schema were by:

- 1) Reinforcing the importance of the concept
- 2) Suggesting the relative importance of the relationships identified
- 3) Clarifying the relative position of a category or property within the schema

The categories discussed herein are:

- Functional and Interpersonal Structures
- Focus on Student Learning
- Leadership
- Data
- Community
- Professional Development

4.1.1. Category: Functional and Interpersonal Structures

The category of **functional and interpersonal structures** (Table 21) represents explicit *policies, procedures, and practices* and implicit *community*

principles working together to create the framework within which the community develops. *Policies, procedures, and practices* are the rules, contracts, and requirements of any district, but in this case, they are designed to support the **community**. *Community principles* represent the interpersonal rules, contracts and requirements between the community members. Together, they set the context for **community** interaction.

The critical concepts in **functional and interpersonal structures** were *policies, procedures and practices* (84 references from 10 sources) and *community principals* (75 references from 11 sources). The relative weight of the number of references along with the way the two concepts work together within the system drove them to become subcategories of the concept of **functional and interpersonal structures**.

Table 21: Functional and Interpersonal Structures

Subcategories	Properties	Dimensions
Policies, Procedures, and Practices 84 refs 10 sources	System of Support 34 refs 9 sources	Focus 15 refs 7 sources
		PLC Stuff 1 ref 1 source
		Reporting 4 refs 1 source
		Clarity 1 ref 1 source
		Planning 1 ref 1 source
		Contracts 1 ref 1 source
		Implementation 1 ref 1 source
	Teacher Evaluation 30 refs 10 sources	Job Descriptions and Evaluation Policies that support community development and management 3 refs 2 sources
		Held accountable 2 ref 2 sources
		Creativity 2 refs 1 source
Schedule 4 refs 3 sources		
Eliminate silos 10 refs 7 sources	Lone wolf syndrome 1 ref 1 source	
Community Principles 75 refs 11 sources	PLC mindset 7 refs 5 sources	Entire district collaborative idea 4 refs 4 sources

Subcategories	Properties	Dimensions
		True learning community 1 ref 1 source
	Counselors 5 ref 4 sources	Support for "doing the PLC" as well as being a teacher 4 refs 3 sources
	Politics 9 refs 5 sources	Working together 1 ref 1 source
		Progress 1 ref 1 source
		Grass roots 1 ref 1 source
		Tough 4 refs 1 source
	Collaborative structure 3 refs 1 source	
	Curriculum alignment 5 refs 4 sources	Intervention 1 ref 1 source
		Enrichment 1 ref 1 source
	Student access to teachers 15 ref 5 sources	Time 8 refs 3 sources
		Learning structures 6 refs 1 source

While *policies, procedures, and practices* are more obviously a typical form of governance in school contexts, *community principles* are the community of practice version of the same concept. The decision to place these two concepts together in this way resulted from theoretical sensitivity regarding the relationships between what the central office must do as part of their job to create joint enterprise – identify policies, procedures, and practices – and what community members must do as they negotiate their joint enterprise among themselves. It also arose from the realization that functional and interpersonal structures are a function of the community. Another way to think of this is that **functional and interpersonal structures** create the overall system of governance within the **community**. The conceptual process that led to these conclusions is discussed in Section 3.7.8.3.2.

4.1.1.1. Description

The subcategory of *policies, procedures, and practices* (84 references from 10 sources) represents the **community** working at the district level to

create the context for **focus on student learning**. The seven properties identify some of the explicit policies that need to be in place. For example, system of support (34 references from 9 sources) represents the district's ability to take a systems perspective on what is happening within the district and what needs to change to focus on student learning.

Some teachers ask me, 'How come we're not doing some of that PLC stuff anymore?' 'You are. You just have no idea because it's ingrained in the culture of the building. Do you work with other staff members on planning, instructional strategies and student intervention?' 'Yeah.' 'Do you have a common essential standards, common formative assessments?' 'Yeah.' 'That's what we're doing.' I just don't want them to harp on it anymore.

Policies, procedures, and practices require negotiation of teacher contracts so that teacher evaluation (30 references from 10 sources) represents a policy that ensures teachers are evaluated on skills and abilities that support the **community**;

you talked about the evaluation model that we are doing, and how that's different. Well, we talk a lot about, "We inspect what we expect."

schedule (4 references from 3 sources) represents creating enough time for teaching subjects as well as enough time for remediation and enrichment to maintain the **focus on student learning**.

...they started to put structures into place; they started to look at the schedules and work with principals to build collaborative time into the school day; they started with asking each grade-level team and each content team (at the middle school) to create a CFA which led them back to getting clearer on Question #1.

The goal of these *policies, procedures, and practices* is to eliminate silos (10 references from 7 sources), which represents moving away from 'lone wolf' teachers behind the closed door of their classroom to the **community** working together to create community practice **focused is on student learning**.

And I implemented the PLC framework for that High School. In 01-02 we were pretty much silos in this district. Everyone did what they thought was right for their school. We all were not on the same page. So we had some schools that were beginning with PLCs and other schools who didn't even embrace it. We had some schools that were doing some common, formative assessment and other schools were not.

Community principles (75 references from 11 sources) represent the implicit ways in which community members govern themselves. There are nine properties to the subcategory *community principles* that represent some of the interpersonal rules, contracts and requirements created between the teachers and between teachers and the administration in order to **focus on student learning** as a community's primary practice.

... a huge change we made in the middle schools is this. I'm sure you're aware of the whole big middle school teaming concept. Which is where you have an English, Math, Science, and Social Studies teacher who have planning together and they also share the same students. You with me? Those 150 loop through them. We switched that. We switched that to where there is no more teaming, per se—kinda sort of, it's there – but our teachers do not have plans by team. It is absolutely by department. So all English teachers are off on this period. All Math, all Science, all Social Studies have their particular period off per day. 50 minute periods for us.

These interpersonal rules, contracts, and requirements range from changing their thinking by taking on a PLC mindset (7 references from 5 sources), where everyone thinks and acts as a community as opposed to an individual, to changing the way they work by incorporating subject matter experts as counselors (5 references from 4 sources) to their practice (at the elementary and middle school levels) instead of interlopers in their classrooms.

Professional Learning Communities is not a program. It's not something you have a checklist for, and you go "Oh, I did this and I did this." It's just an overall mindset and a way of doing business and a way of thinking. (School Principal)

It doesn't matter what background or what job you have in the school, whether it's the Principal, Teacher, Admin Assistant, Counselor, it's the entire group of educators there that are very committed to working as a team in a collaborative nature. (School Principal)

Within *community principles*, becoming a true learning community means including students and teachers in continuous cycles of learning. Politics (9 references from 5 sources) represent the negotiation of ways of acting and thinking within the *community principles*. *Community principles* includes creating collaborative structures (3 references from 1 source) – time, space, and reasons for teachers to work together to focus on student learning.

For staff, we needed collaborative structures. So, if you and I are both 8th grade Math teachers, we need time during the school day to sit there and talk about our

students, our assessment data, instructional strategies (what are we going to do if students don't learn; how are we going to share the load in helping those students). So rather than just a teacher teaching in a classroom with four walls and closing the door and not talking to other teachers, we had to build collaborative structures during the day.

One of those reasons is to create curriculum alignment (5 references from 4 sources) across grades and subjects so students are all being taught the same thing at the same time, which then allows for remediation and enrichment as a **community** instead of as a single teacher with a single class.

And our English department is a good size but we split, and this maybe something else that's interesting...we have maybe, and I'm not counting exactly, 10 - 12 English teachers. We split 9/10 and 11/12 for PLC meetings. And the reason we do this is because it's just easier for the 9/10 teachers because their curriculum is more aligned and the 11/12 teachers' is aligned. Now we do meet, every so often, as a large group.

Community principles ensure student access to teachers (15 reference from 5 sources), and since the teachers are functioning as a community, students have access to more than their homeroom teacher.

The reason for that extra time during the day is a couple. 1) Instead of relying on it depending on what teacher you have, as far as a lottery of... Hey, I'm assigned to Denny as a Math teacher, but he coaches every day after school, three sports, all season long, so I can never get extra help after school. Where maybe Barb helps all of her students. So that's not really fair to those students. So that's one reason for creating that during the day. Students can get here. It's during the school day. They don't have to worry about which teacher they have in terms of if they can get help or not.

4.1.1.2. Axial Coding of Functional and Interpersonal Structures

Within the category of **functional and interpersonal structures**, *policies, procedures, and practices* are a **causal condition** that enables the **community** to function. When the district level community members create a system of support so that the culture is able to change and internal politics are supportive of collaboration teachers are able to make the change from teaching to learning and **focus on student learning**. For example, the

dimensions of planning, teacher contracts, and implementation help create that system of support. Making time for everyone to reflect and plan to support each other and the students sets the context for the community. Only the district can negotiate teacher contracts. By ensuring that those contracts include requiring teacher collaboration and measuring their ability to do so (which supports the community) as opposed to measuring teachers individually based on student scores, for example, begins building the culture of the collaborative community.

Additionally, *policies, procedures, and practices* that rework school day structure such that it supports **community** by providing common teacher preparation times and supports the students by providing enough time for teaching and remediation, influences the politics of the *community principles*. Teachers, Principals, and Administrators are willing to do the hard work that begins at the grass roots of building the **community**, because they see it is valued. The teachers feel valued when *policies, procedures, and practices* are designed to support communities of practice and teachers are evaluated on those requirements: “We inspect what we expect.”

Community principles are an **intervening condition** within the **functional and interpersonal structures** concept. While *policies, procedures, and practices* set the scene for the **community to focus on student learning**, *community principles* activities systematically drive those conditions forward. Politics, which are generally considered to create “soft” rules (as opposed to the hard and fast rules of *policies, procedures, and practices*), is actually a critical piece in determining whether *policies, procedures, and practices* and *community principles* are respected. The dimensions of this property demonstrate the range and impact politics plays within the community. For example, ‘working together’ and ‘progress’ create continuums of behavior from working well with others to getting in the way of being able to work together. One of the ways that members can sabotage collaboration is through being overly critical and even outright defying the collaboration requirement. However, when the politics of the community operate in a positive way, the behaviors identified in *policies, procedures, and practices* become the authorized standard such that the **community** becomes unconsciously competent as a PLC. That is, they are no longer conscious of ‘doing’ PLC things, the PLC mindset has taken over and ‘doing’ PLC things is synonymous with the ‘way we do things’. Creating the true learning community requires collaborative structures that provide ways and means for

teachers, administrators, and coaches to collaborate. Creating collaborative structure ties back to the **causal condition** of *policies, procedures, and practices* that make time in the schedule for meeting, discussion, and reflection.

The concept of **functional and interpersonal structures** impacts the **community** at the macro level. In this context, *policies, procedures, and practices* and *community principles* create the space for the community to develop and thrive. As demonstrated in Figure 42 below, **functional and interpersonal structures** set the stage for the **actions/interactions** of teachers and administrators as they go about their daily work. For example, when there are no *community principles* and no *policies, procedures, and practices* to support community of practice, you get lone wolf teachers in their classrooms behind closed doors. Whereas, when you have some *policies, procedures, and practices* that encourage community activity, but *community principles* are limited or non-existent, you get cynical resistance to the **community**. Finally, when you have fully implemented *policies, procedures, and practices* and *community principles*, the district achieves the collaborative structures necessary for the district to focus on student learning.

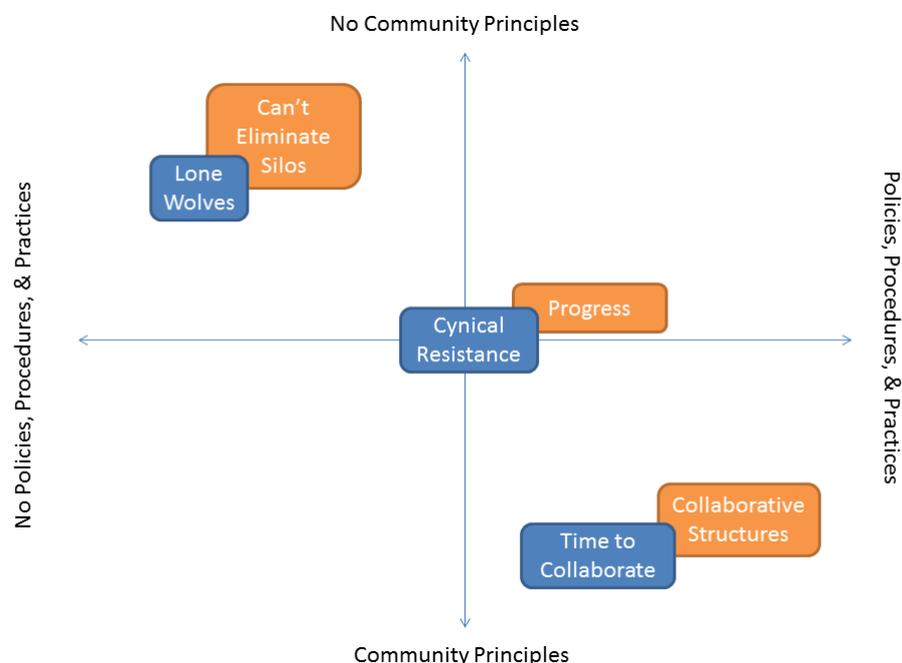


Figure 42: District Policies and Community Principles Dimension Matrix

4.1.2. Category: Focus On Student Learning

The category of **focus on student learning** (206 references from 12 sources) (Table 22) represents the district's ability to change focus from teaching to learning (Rick DuFour, 2003). Rather than being focused on the techniques and affordances of teaching 30 students at a time, the district supports a teacher's ability to focus on what one student at a time needs to learn. **Focus on student learning** is the domain of the Professional Learning Community.

While the category name and the first four properties of *systematic response* are all terms and concepts from DuFour, Eaker, and Many's (2006) Professional Learning Community theory, these codes arose from *in vivo* coding of nearly all of the interviews. The districts and schools from which the data was collected all studied through and with DuFour and his associates. Therefore, it was no surprise that these were terms that arose regularly in the open coding stage. They were often spoken of with passion and deep conviction of their necessity, and the researcher did not want to lose the power of the words.

*"Also, within those collaborative structures, we've got that shared terminology, shared understanding, because we are all at a similar place in the standards, because we've created/developed our own **pacing guides**."*

*"Where I learn the most? It's probably talking through the **pacing guides**."*

*"...when they get together and talk about their **CFA** data, then they say, "Okay, we're going to, based on this data, we're going to intervene by classrooms, just by classrooms or we're going to do a grade-level mixup, or here's what we're going to do intervention-wise at the elementary school..."*

*But I feel like we're **focused** more **on** how to get the **students** to **learn** and not just new techniques that are out there and then go back to your room and do the same old thing that you used to do.*

The terms were used so frequently and in so many different situations that the researcher originally placed them into their own category: "Framework." During analysis and constantly comparing the data (see Section 3.7.7.3.3), the researcher realized that the framework was what made the focus on student learning possible. There were other words specific to PLC theory that were not used as codes or were subsumed into more general terms for the concepts represented. For example, DuFour puts all of the activities into categories that

he calls the Three Big Ideas: Collaboration, Results, and Learning. These terms were coded, but ultimately became properties or dimensions of other concepts.

The concepts that rose to become subcategories were concepts that appeared frequently in the data. *Systematic response* (134 references from 12 sources), *change in practice* (20 references from 5 sources), and *meeting needs* (9 references from 5 sources) each had a substantial number of codes. The properties of those subcategories also appeared fairly frequently in the data. This served to reinforce their importance as part of the category as well as the importance of the category itself.

Table 22: Focus on Student Learning

Subcategories	Properties	Dimensions
Systematic Response 134 refs 12 sources	Four Critical Questions 44 ref 6 sources	Driving focus on student learning 2 refs 2 sources
	Pacing Guides 38 references 10 sources	Answers Question 1 9 ref 5 sources
		Curriculum design 11 refs 5 sources
	Common Formative Assessments 19 refs 6 sources	Answers Question 2 8 refs 6 sources
	Action Research 1 ref 1 source	
	Whole school/district response 16 refs 5 sources	Vision 2 refs 1 source
		Learning structures 6 refs 1 source
		Cohesive 1 ref 1 source
		Trust 1 ref 1 source
	PD connected to student learning 16 ref 5 sources	District-wide methods 11 refs 5 sources
Coaching/Methodology Leadership 2 refs 2 sources		
Change in Practice 20 refs 5 sources	Teaching to Learning 15 refs 4 sources	Resistant to change 1 ref 1 source
		Necessary struggle 1 ref 1 source
		Shared students

Subcategories	Properties	Dimensions
		1 ref 1 source
		Share the load 3 refs 1 source
		Re-teach 1 ref 1 source
		Be the best for the kids 1 ref 1 source
		PD with context 5 refs 3 sources
		Changing teaching methods 1 ref 1 source
Meeting Needs 9 refs 5 sources	Successful Students 5 refs 5 sources	Entire district collaborative 1 ref 1 source
		Failure 1 ref 1 source
		Student Engagement 1 ref 1 source
		Access to Teachers 1 ref 1 source
	Series of changes 3 refs 2 sources	Interventions 1 ref 1 source
		Results 1 ref 1 source

4.1.2.1. Description

The subcategory of *systematic response* derives from the theoretical basis of PLCs (systems thinking) and contains six properties that represent the context within which the focus on student learning happens. As demonstrated in Figure 43: Cycles of Action Research, the Four Critical Questions, pacing guides, common formative assessments, and action research properties comprise the framework of the Professional Learning Community (Richard DuFour et al., 2006).

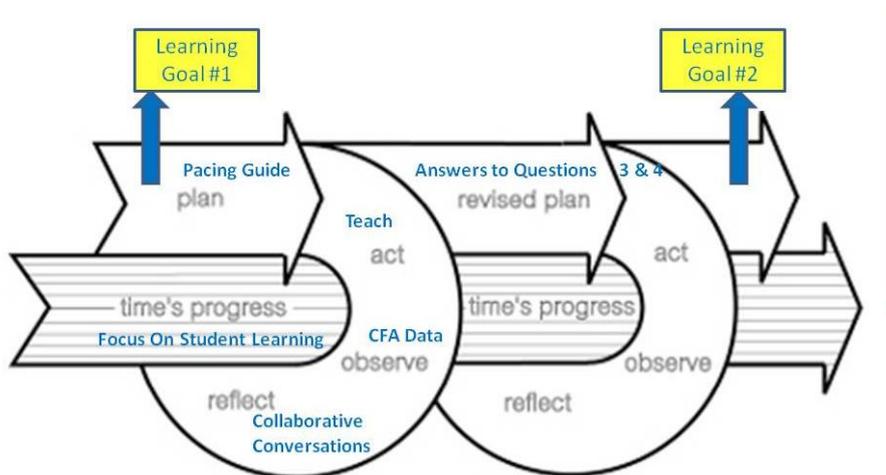


Figure 43: Cycles of Action Research

It is important to note that the property of action research was not a term most of the participants used explicitly. While most of the study subjects never used the term 'action research' to describe what they were doing, one of the last interviews I conducted did use the term:

It doesn't matter what background or what job you have in the school, whether it's the Principal, Teacher, Admin Assistant, Counselor, it's the entire group of educators there that are very committed to working as a team in a collaborative nature. Along with looking at best practice action research with the big focus on student learning.

This made me reconsider the process the rest of the interviewees described in terms of action research process.

As I analyzed the data the concept of cycles of action and reflection became clear. I saw this not only in the teaching and learning process described above, but in the administrative and change processes as well. For example, the way that administrators determined schedules and methods for addressing student needs used action research cycles to plan, act, reflect, and adjust. Ultimately, action research that is key to the ability to make the change from teaching to student learning

Analysis of the concept of *systematic response* identified properties and dimensions such as the Four Critical Questions (44 refs from 6 sources) that represent the *systematic response* that creates **focus on student learning**. Ensuring these questions are answered walks the teachers through at least two cycles of action research. The first question is: "What do we want students to learn?" Creating pacing guides (38 references from 10 sources) answers this question and creates the action research 'plan.' According to one participant,

"...what pacing guides mean in our system ...it means that here's a window of time... so what collaborative teams do--say a 3rd grade team -- they'll meet and say let's look at these next targets coming up to be taught in trimester 1, let's pair these two reading targets with this writing target, let's talk about how we're going to do that, how many instructional days do we think that will take -- and every teacher is free to approach that and teach to those targets any way they choose."

Teaching the planned standards is the 'act' step of action research. The second question is: "How will we know when each student has learned it?" Creating common formative assessments (CFA) (19 references from 6

sources) answers this question and provides data for the 'observe' stage. Questions three and four can be summed up as: "How can we improve on current levels of student achievement?" This is the 'reflect' stage of action research (1 reference from 1 source). Teachers use the CFA data to inform their reflection and guide the new plan that starts the next cycle of action research.

"So we really need to pace that out, so that we can give ...create and give CFAs and look at that data together in a meaningful way in our instructional cycle."

In this way, **focus on student learning** redirects action research in the service of student learning as the third cycle moves on to new learning goals and standards.

The last two properties of *systematic response* are whole district response (16 references from 5 sources) and PD (professional development) connected to student learning (16 references from 5 sources). Whole district response represents the system involved and how it plans to respond to student needs. That is, the whole district (from Superintendent to Intervention Specialist) is involved in answering the Four Critical Questions. The whole district is committed to ensuring students learn and doing whatever it takes to accomplish this.

This is a whole school response. So if they are struggling with writing maybe. Supporting main idea and details in a summary writing piece, then instead of just the English teacher doing that, we're providing an intervention that could be taught by an English teacher; in our case it's a Social Studies teacher that's really good at writing and he's calling back students that need extra help with this. It's a school responding rather than just the individual teachers.

For example, as shown in the quote, teaching schedules are arranged to provide time for remediation and enrichment of groups of students. Who provides the remediation or enrichment is not dependent upon who the student's primary teacher is. PD connected to student learning (16 references by 5 sources) represents the need for teacher professional development to be driven by the **focus on student learning**. That is, teacher professional learning can focus more on pedagogy since the district has determined the methodological focus. This focus on pedagogy is supported by subject matter experts as coaches and is centered on individual student learning. As one participant put it:

“But now it's more connected to students learning, how well they're doing, if they're not getting it. What can we do to improve the learning?”

Along with the context of *systematic response*, teachers make the critical *change in practice* from teaching to learning (15 references from 4 sources). These concepts are at the core of **focus on student learning**. *Change in practice* is supported by the data (20 references from 5 sources) as a critical aspect of being able focus on student learning. One participant said:

...to be honest, when you're thinking about your teaching you tend to rely on what you enjoy and what you are comfortable with. But when you're focusing on the students' learning, you're looking at each student and what they need.

While another participant provided some specific examples of what that change looked like for her:

I would say, one of the biggest changes I've made is that I give more opportunities to learn the material rather than testing on the material and moving on. So, just not settling for a 0% or settling for a 50%. You know, I'd like you to learn this. So we're allowing for re-takes or re-dos on a test. And that's something as a first year teacher I did not do. I also used to have tests that were very long and all multiple choice. I really changed my style for English. I just got away from that because it wasn't really what the students needed and it doesn't really show what they know and what they've learned.

Teachers and administrators are sometimes resistant to this change, but when they do the hard work necessary to become a PLC, they realize it is a necessary struggle. Analysis of the data demonstrated that teachers and administrators have previously had to accept student failure as inevitable – that is, when teachers are functioning as a solo artist. However, in the context of the *systematic response* to **focusing on student learning**, teachers become part of a larger system whereby they share both student failure and ideas about how to address the failure. One teacher put it this way:

“And then my thinking....top, top, top most wonderful access to PLC is that every single student matters so much. And there's no discard, 'Well, you know, 80% of my kids are doing great. You know, who cares about that lower fifth percent.' It's not like that. There's no way I'm going to let you have a zero. We're going to do this work and we're going to do it together. I'm going to help you. And if it hasn't

happened, it's on me. And I'm fine with that. I'm fine with looking at it that way. As a matter of fact, I'm more than fine with that."

This puts their professional development into a specific context; a context where professional learning is embedded in their job.

A lot of learning, and I'm going to say professional development are those things that help us learn and get better. If it reflects and causes changes in instruction, which hits students, and those meetings and discussion really do come back to impact teacher's instruction.

A context where they don't have to accept failure, they have the opportunity to reteach their students, and they can be the best for the kids. In this environment, changing methods is a small adjustment. In this environment, they don't have to keep doing things the way they have always done them.

The sub-category of *change in practice* only has one property, teaching to learning, but this is the pivotal piece of the category. As the dimensions demonstrate, it is a complex process to achieve the *change in practice* that needs to happen to **focus on student learning**. Teaching to learning represents the struggle to change from thinking about me to thinking about you. It also represents the *change in practice* from 'me' to 'us'.

The sub-category of *meeting needs* (9 references from 5 sources) contains two properties that represent the outcome of **focusing on student learning** and the way those changes occur. Successful students (5 references from 5 sources) represent the outcome of focusing on student learning while series of changes (3 references from 2 sources) represents the fact that the students' needs are met by the community making incremental changes through the *systematic response*. One participant put it best:

Most of the time, when you go in a classroom, you don't even know who's special ed and who's not. I mean it's truly that we are meeting needs of ALL kids and those interventionists and them are working with the teachers wherever we need them.

4.1.2.2. Axial Coding of Focus on Student Learning

Within the category of **focus on student learning**, the sub-categories of *systematic response* and *change in practice* are primarily **causal conditions** that result in *meeting needs* of students through the district's

focus on student` learning. The properties of *systematic response* demonstrate the conditions that need to exist in order to focus on student learning. That is, as the PLC 'framework' (4 Questions, Pacing Guides, CFAs, and Action Research) is systematically implemented district-wide the *change in practice* occurs and the **focus** turns from teaching to learning. PD (Professional Development) is connected to student learning and meeting the needs of students.

These **causal conditions** set the context for the processes or **actions/interactions** that occur within focus on student learning. These **actions/interactions** happen when the subcategory of *change in practice* crosses with the systematic implementation of the PLC framework (see Figure 44: Focus on Student Learning Dimension Matrix). In these two sub-categories, one finds teachers interacting through a necessary struggle to change their practice to be the best for their students thereby *meeting the needs* of students. The PLC framework provides the structure in the form of specific tasks or practices within which the teachers make the change. This is the community forming and demonstrates the process of changing from 'me' to 'you' and from 'mine' to 'ours'.

The result of the intersection of the properties of *systematic response* and *change in practice* is *meeting needs* of students. This is demonstrated in Figure 44: Focus on Student Learning Dimension Matrix below that shows the dimensions of meeting needs as they intersect across the **causal conditions** of *systematic response* and *change in practice*. When there is no systematic response or change in practice, students needs are not met, because they have limited access to teachers for support, only the neediest students receive intervention, and the district has overall poor standardized test results. Once the *systematic response* and *change in practice* have begun, students begin to have more access to teachers; more students are identified and receive intervention support, and the district's standardized test results begin to improve. Finally, when enough *systematic response* and *change in practice* have occurred, students receive enough access to teachers for support, all students who need it receive intervention, and the district's overall standardized test results improve to meet the requirements set by the Board of Education.

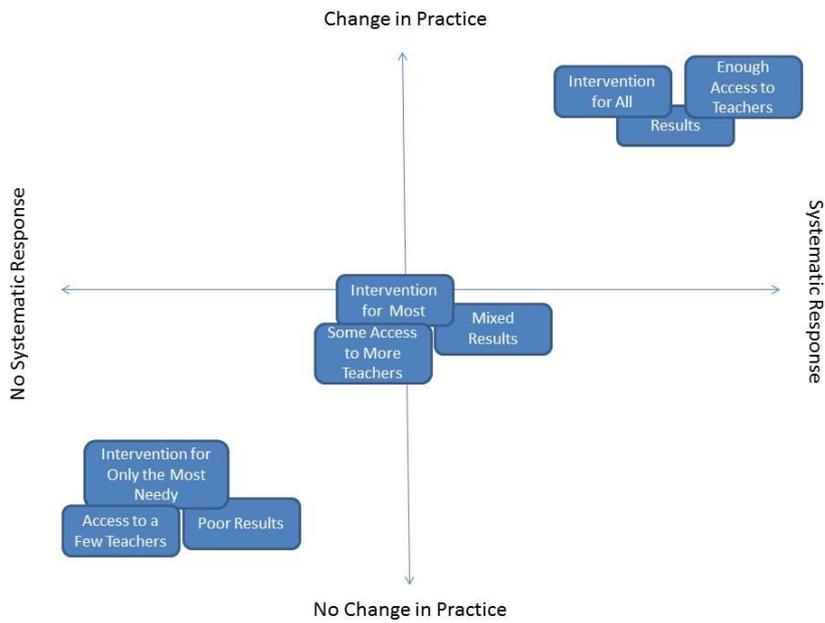


Figure 44: Focus on Student Learning Dimension Matrix

4.1.3. Category: Leadership

The category of **leadership** (Table 23) represents the ability to act as a change agent by creating a vision of the future that **focuses on student learning**. **Leadership** also represents the ability to support and mentor staff into that vision so everyone is able to stay-the-course. **Leadership** is present at multiple levels of the district structures—from the Board of Education to the Superintendent of Schools to central office staff, principals, and teachers. **Leadership** is a function of the community as opposed to a role played by a specific person or group.

The concepts that rose to become sub-categories of **leadership** did so based on the strength of the need for each element to participate in **leadership** along with the strength of their numbers. As stated above, *central office* (24 references from 6 sources) and *principals (are key)* (19 references from 8 sources) are part of the district system, but it is how the members of these groups lead while the PLC is forming that is critical and is supported in their associated properties. *Coaching culture* (10 references from 4 sources) bridges the transition from system leadership to **leadership** being a function of the community through *constantly improving the process of teaching* (56 references from 10 sources). The significant increase in references for *constantly improving process of teaching* might suggest a relationship

between the number of people participating in **leadership** once the PLC has formed.

Table 23: Leadership

Subcategories	Properties	Dimensions
Central Office 24 refs 6 sources	Vision 2 refs 1 source	Focused on Student Learning 10 refs 5 sources
	Board of Education 2 refs 1 source	
	Administration 2 refs 2 sources	
	Identify Core Competencies 9 refs 4 sources	
Principal is Key 19 refs 8 sources	Vision 2 refs 1 source	Transformational 1 ref 1 source
	Leader 2 ref 2 sources	
	Reciprocal Accountability 1 ref 1 source	
Coaching Culture 10 refs 4 sources	Modeling 3 refs 3 sources	
Constantly Improving Process of Teaching 56 refs 10 sources	Supporting community 34 refs 7 sources	PLC work valued 3 refs 3 sources
		Changes in Structure 12 ref 7 source
	Resources 12 refs 5 sources	Providing what teachers need 4 refs 4 sources
		Time 6 refs 3 sources
Reflection 9 refs 4 sources	Continuous Improvement Embedded 6 refs 2 sources	

4.1.3.1. Description

The data for **leadership** fell into four different sub-categories: *central office* (24 references from 6 sources), *principal is key* (19 references from 8 sources), *coaching culture* (10 references from 4 sources), and *constantly improving the process of teaching* (56 references from 10 sources). The first three sub-categories represent the traditional management roles in school districts: central office, principals, and subject matter expertise coaches. *Constantly improving the process of teaching* represents the teachers' role. Together, these four sub-categories demonstrate a distributed leadership model that allows leadership to be a function of the community as opposed to a specific management role. Since leadership represents "the ability to act as a change agent by creating a vision of the future," each of the sub-categories has the property of vision (2 references from 1 source). Vision, in this case, McDonald, Barbara

represents each sub-category's ability to cast and enact the value of the PLC work.

The first two sub-categories (*central office* and *principal is key*) work together, because they are system-defined management roles. *Central office*, as it fits within **leadership**, represents the actual structure and responsibilities of a district's *central office* function. In many cases, the *central office* is where the PLC vision (2 references from 1 source) begins. Board of education (2 references from 1 source) and administration (2 references from 2 sources) represent properties of the *central office* that are real roles necessary to run the school district business. The property of identify core competencies (9 references from 4 sources) represents the central office's critical function in supporting the community of practice focusing on student learning. Identifying the core competencies of the members of the community (including central office and principal functions) ensures that hiring and evaluation are consistent with the community's goals. One interview summed it up this way:

Everyone has the same core competencies, and those come out of Patrick Lencioni. Learning: we accept learning as a fundamental purpose of our district. Collaboration: we are committed to collaborating. Results: Results drive our decision making. So those are the core.

While another interview elaborated on the execution:

We wrote our own in <study district>, and so the teachers are evaluated on exactly the expectations... it's about student learning. And then you've got I follow my pacing guide. I do my common formative assessment. But the 2nd big bullet is collaboration: I talk, I meet, I work with others. So they want to get a high score, which would be a 3 on that. Not that it's fake, I think it's kind of turned into, 'okay, well darnit, these are real discussions, and I'm getting better because of it.'

That is why all of this has some dimension of being *focused on student learning* (10 references from 5 sources). Every **leadership** task within the *central office* is the implementation of some level of **focusing on student learning**. The vision, Board of Education, the general administration, and core competencies all revolve around some aspect of *focusing on student learning*.

The *principal is key* (19 references from 8 sources) sub-category represents the ability to model appropriate community behaviors (i.e., the identified core competencies) as defined by the PLC vision (2 references from

1 source). This is demonstrated via the two properties of leadership (2 references from 2 sources) and reciprocal accountability (1 reference from 1 source). Leader represents the ability to define and communicate the community's vision in such a way that it becomes transformational.

But a manager, the best they can ever ever acquire is compliance, and we don't want people to be just compliant. We don't want to just manage behaviors, we want to inspire--we want to be an instructional leader, so that we create that commitment.

Reciprocal accountability represents the concept of being willing to do what you are asking someone else to do.

Rick DuFour ... talked about reciprocal accountabi-lity. And anything that you ask of others,[you have to be willing to do and support yourself.

These real functional roles are not likely to go away with the development of the community of practice; however, when they are conceived of and executed in these manners, the functional roles are placed on equal footing with the rest of the community members.

The third sub-category, *coaching culture* (10 references from 4 sources), represents both a management function and the mindset of the community to learn together. While districts regularly hire or appoint subject matter experts to act as coaches for teachers and tutors for students, in this case, the concept of *coaching culture* represents those subject matter experts modeling coaching behaviors so teachers can learn to coach each other.

So we've had some amazing professional development with some unbelievable consultants around the nation that have come in and worked with us on a continual basis. However, I have to tell what I believe -- that's important and that's good, but we've created a coaching culture that is critical.

This is driven by the vision of the PLC. Modeling (3 references from 3 sources) represents the importance of being the change you seek. As one director stated:

I do everything I can to model for them how to lead in their buildings. I model for them how to review data. I model for them how to lead professional development. I model for them how to create the collaborative culture. All those things.

Modeling is closely related to reciprocal accountability within the category of **leadership** in that modeling is exhibiting the appropriate behavior and reciprocal accountability is the concept that you cannot expect behavior from others that you are not willing to exhibit yourself.

The fourth sub-category, *constantly improving process of teaching*, (56 references from 10 sources) represents the community's ability to identify ways to improve its practice.

You have to constantly look at your processes and make improvements and tweak.

This is teacher leadership in action; understanding and implementing the vision that represents doing the work of the PLC. The property of supporting community (34 references from 7 sources) represents the community's experience of itself enacting the vision. Resources (12 references from 5 sources) represent providing what teachers need to **focus on student learning**. Reflection (9 references from 4 sources) represents the community's ability to identify ways to improve mutual engagement. As one interviewee stated:

...because sometimes administrators can come in and give another point of view. And they can also, you know, help that discussion and even direct you to the correct resources. Or make those resources available. So I think they need to be available to join in on the PLC's.

4.1.3.2. Axial Coding of Leadership

Central office works in **leadership** as a **causal condition**, because it sets the context for the community by identifying appropriate behaviors. However, *principal is key* is an **intervening condition**, because its key goals are communicating a clear vision and modeling appropriate community behaviors (see Figure 45: Leadership Dimension Matrix). A key leadership task is to model the desired learning and collaboration behaviors across the enterprise to create reciprocal accountability and trust across the community. When the *Central Office* is not identifying and supporting appropriate behaviors and principals are not able to articulate a vision for the community, then the community never gets off the ground. Silos of teachers stay in place and they have no reason to change. When the *Central Office* has identified appropriate behaviors, but the Principal does not model them and cannot

clearly express a vision for why others should, the community is met with cynical resistance. However, when Central Office and Principals are casting a singular, clear vision and Principals are modeling the expected behaviors, the community builds the collaborative structures it needs as a result of the trust between the members.

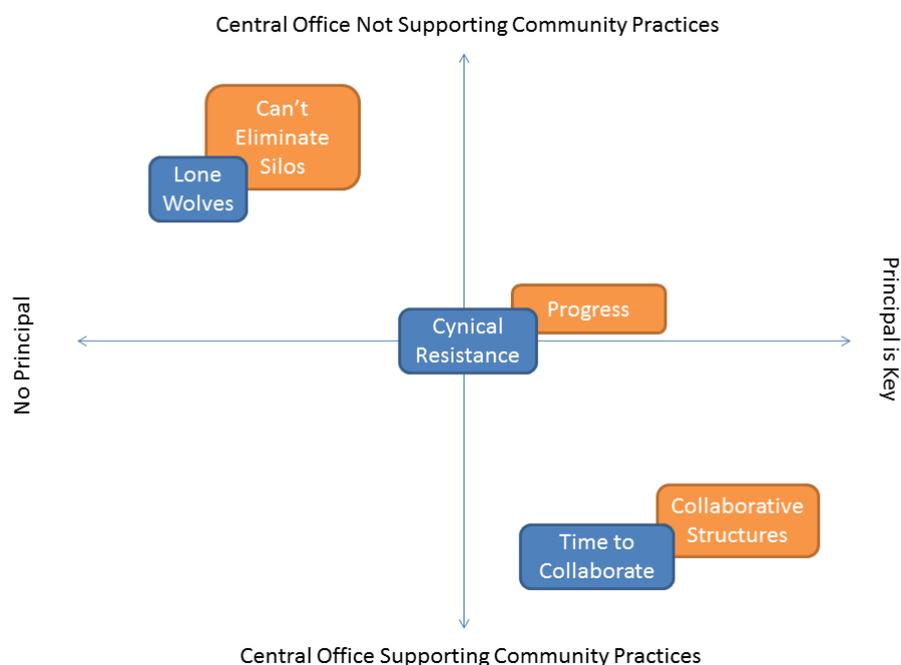


Figure 45: Leadership Dimension Matrix

*Constantly improving process of teaching is an **intervening condition**, because these **strategic actions/interactions** are “purposeful or deliberate acts taken to resolve a problem and in doing so shape (Strauss & Corbin, 1998, p. 133)” the collaborative structures. It is the purposeful changes to schedules, resources, and personnel that build the **community** and drive the **focus on student learning**. *Constantly improving teaching processes* can only happen when the district and school has a vision for doing PLC work. When the district has the correct vision, time and resources are made available to support the community. A resource can be either physical or ethereal. That is, books, desks, and space to work are considered resources, but a resource can also be time. Time represents the ability to address the Four Critical Questions. Time to thoughtfully understand standards in order to create pacing guides. Time in schedules to ensure CFAs are given and data is analyzed. Time in schedules to answer questions 3 and 4 and provide remediation and enrichment. Time, deliberately allocated in these ways, serves to *constantly improve teaching processes*.*

Coaching culture is a **causal condition** in that modeling behavior and reflection on actions undergirds all leadership activities. The **community** is sustained when a *coaching culture* is present, because *coaching culture* represents the importance of sharing knowledge, which is at the core of a community of practice.

4.1.4. Category: Data

Data (Table 24) represents measurement and provides objective evaluation of success and failure of student and teacher. The community knows whether it is successful with its **focus on student learning** based on **data**, because **data** answers the question, ‘Have the students learned what we’ve set out to teach?’

The data around the concept of **data** points clearly to the important role **data** plays within the **community**. As the **community focuses on student learning**, **data drives instruction** (35 references from 8 sources) and *de-personalizes* (15 references from 6 sources) the conversations about student achievement. These conversations happen as a result of the *common formative assessments* (14 references from 7 sources) that **answer question #2** (5 references from 3 sources). The dimensions are indicative of the scope of the properties that help define the subcategories.

Table 24: Data

Subcategories	Properties	Dimensions
Drives Instruction 35 refs 8 sources	Purpose 18 refs 8 sources	Anecdote 1 ref 1 source
		Data 13 refs 7 sources
		Assessment 2 refs 2 sources
Common Formative Assessment 14 refs 7 sources	Answers Question #2 5 refs 3 sources	Powerful 1 ref 1 source
		Rigor 1 ref 1 source
		Opportunity to remediate 3 refs 3 sources
De-personalizes 15 refs 6 sources	Data Driven Decisions 9 refs 5 sources	Gaps are identified 2 refs 2 sources
	Less defensive 1 ref 1 source	

4.1.4.1. **Description**

The category of **data** contains three sub-categories that represent the importance of **data** to the **community**. The first sub-category, *drives instruction* (35 references from 8 sources), represents the reason to gather data (i.e., purpose (18 references from 8 sources)). *Drives instruction* represents the strategies and methods teachers will use for the purpose of remediation and enrichment.

I love data drive decision making. Otherwise it's arbitrary. Otherwise it's just based on...sometimes it's based on those things that stick out. You know, the anecdotal things and really they're not that common. You think you've got a number of kids doing it this way and you realize, when you look at the collective data, they're not doing it that way. You know, it's just the few kids that stick out in my mind.

The sub-category, *common formative assessment* (14 references from 7 sources) answers question #2 ("How will we know when each student has learned it?") (5 references from 3 sources) and represents **data's** place in the PLC framework. *Common formative assessment* represents assessment that ensures teachers are comparing like to like during instruction. They have taught the same content at the same time, and are now assessing their students with the same assessment. The resulting conversation about whether or not students have learned *drives instruction*.

But now it's more connected to students learning, how well they're doing, if they're not getting it, what can we do to improve the learning. We actually use the data to see what they're getting and what they're not getting.

The last sub-category in **data** is *de-personalizes* (15 reference from 6 source). *De-personalizes* represents the effect that good data (provided by the CFAs) has on the conversations needed to determine the answers to questions 3 and 4 in the PLC framework.

here's where we are, here's the progress we've made on the comprehension word-work skills that we've been working on this quarter--we report out to him. And then we create a structure of, okay one of the elementary schools is having amazing results--okay, what are you all doing? Are you doing something that we're not doing? How is it that you've gotten those amazing results.

The property of data driven decisions (9 references from 5 sources) represents the way the data is used; to make decisions. It takes the

guesswork out of the decision making process and means experienced and inexperienced teachers are on a level playing field. The last property, less defensive (1 reference from 1 source), is an outcome of the *de-personalization* brought about by the data.

Interviewer: If one teacher does it one way and another teacher does it another way, and the one teacher has better success on the CFA, well, you know...on the other hand it also takes that sort of basis for the decision takes the personal out of it a little bit. It's easier to be less defensive?

Interviewee: Yes.

Interviewer: Ok. Because you're not talking about my teaching so much anymore. Right? You're talking about whether my students learn and the technique...

Interviewee: Yes.

4.1.4.2. Axial Coding of Data

All three of the subcategories of **data** provide the context for **community** conversations about learning; *drives instruction* is a **causal condition** while *common formative assessment* is an **intervening condition** and *de-personalizes* is the consequence of the intersection of the **causal** and **intervening conditions**.

The purpose of gathering and discussing **data** is to *drive instruction* – this is where the power of the **data** resides. While the pacing guides determine the sequence in which standards are addressed, and, therefore, instruction, it is **data** that determines success or failure of those strategies. When teachers and administrators choose to do something with the data, student success increases. When used powerfully, **data** assists the teachers and coaches in determining the best course of action for remediation and enrichment; thereby *driving instruction*. **Data**, as it is gathered in a PLC, provides a rigor for decision making, because it ensures those decisions are focused on student learning and comparing like to like.

In fact, the manner in which **data** is gathered has the potential to change the instructional conversations. *Common Formative Assessment* is an **intervening condition** because it provides a specific method of assessment that answers question #2 ('Have the students learned what we've set out to teach?'). It is important to consider *Common Formative Assessment* as a

whole and not break apart the concept into its constituent parts of 'common' and 'formative'; it is the combination of those parts that carries the power.

Many schools use common assessments (e.g. provided for by Publishers or internal content writers), but they don't use them formatively. And many other schools assess formatively, but there may not be anything in common between the assessments or timing of the assessment within a grade or subject. The result of grade level or subject teachers in a PLC agreeing what to teach, when to assess, and how to assess, is the ability to collaboratively address all of the learning gaps identified in their students' assessment results. This reduces reliance on anecdote thereby allowing teachers to rely on facts as opposed to hunches.

De-personalizes is a consequence and becomes a **contextual condition** in that the properties of *de-personalizes* intersect dimensionally (as demonstrated in Figure 46: Contextual Condition: De-personalize) with the properties of *drives instruction* and *common formative assessment* to create a set of circumstances to which members of the **community** respond through **actions/interactions**. When the purpose of **data** is to *drive instruction* and the answer to question #2 is arrived at both *commonly and formatively*, gaps are clearly identified, teachers have the opportunity to remediate, and the conversation is about our data in order to ensure that our students are successful. However, when the **data** is gathered, but isn't *driving instruction* or arrived at either *commonly or formatively*, teachers are left with many questions. Is the data accurate? Was the problem my teaching or the assessment? Should I take the time to remediate or just move on? When **data** does not *drive instruction* and it is gathered neither *commonly nor formatively*, gaps are not identified accurately, teachers are defensive about their teaching skills, and students are left behind.

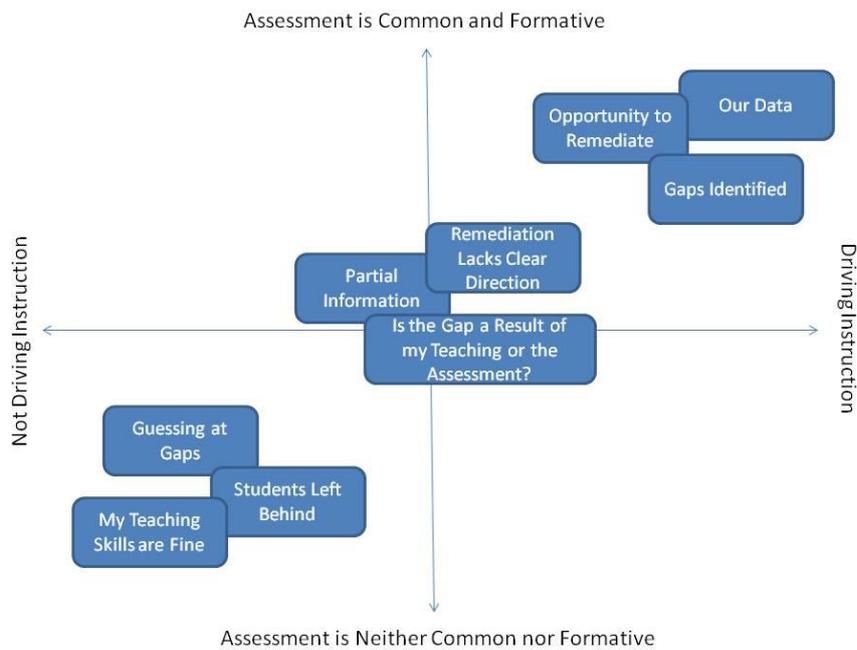


Figure 46: Contextual Condition: De-personalize

4.1.5. Category: Community

The category of **community** (Table 25) represents the sharing and trust that is created over time through working together toward the goal of **focus on student learning**. When teachers focus their practice on student learning instead of on how well they teach, competition is minimized, trust is established, and the **community** of teacher-learners emerges.

While *collaborative culture* (68 references from 10 sources) and *creating knowledge* (62 references from 11 sources) are concepts with many references, **community** requires *accountability* (18 references from 6 sources) and *enactment* (11 references from 5 sources) or all the community does is talk about what needs to be done. The number of references for *collaborative culture* and *creating knowledge* reinforces the decision to make them subcategories of community. The emerging theoretical schema drove *accountability* and *enactment* to become subcategories as well.

Table 25 : Community

Subcategories	Properties	Dimensions
Collaborative Culture 68 refs 10 sources	Collaboration 40 refs 10 sources	Entire School/Subject/District 3 refs 3 sources
		Compromise 1 ref 1 source

Subcategories	Properties	Dimensions
	Interdependent 11 ref 4 sources	Working together between grades/subjects 5 refs 2 sources
	Know what we need to do together 2 refs 2 sources	Focus on Student Learning
	Cohesive 2 refs 1 source	Bond 1 ref 1 source
	Resources 11 refs 6 sources	Share techniques 9 refs 5 sources
Accountability 18 refs 6 sources	Meetings 5 refs 3 sources	Discuss student progress
	Do the work of the PLC 6 refs 3 sources	Passion for kids 1 ref 1 source
	Planning 4 ref 2 sources	Not alone 3 refs 1 source
Enactment 11 refs 5 sources	Art and Science 4 refs 2 sources	Student learning 1 ref 1 source
	Trust 2 ref 2 source	Trying new methods 1 ref 1 source
Creating Knowledge 53 refs 11 sources	Coach 6 refs 5 sources	Understanding in context 2 refs 2 sources
	Discussions 27 refs 9 sources	Conversation Converts to Knowledge 1 ref 1 source
	Learn from Each Other 2 ref 2 source	Make sense 1 ref 1 source
	Shared meaning 18 refs 12 sources	Shared Terminology 5 refs 2 sources
		Shared Understanding 13 refs 5 sources
		Shared Ideas 8 refs 5 sources

4.1.5.1. Description

The category of **community** consists of four sub-categories identified as *Collaborative Culture* (68 references from 10 source), *Accountability* (18 references from 6 sources), *Enactment* (11 references from 5 sources), and *Creating Knowledge* (62 reference from 11 sources) that represent Wenger's (1998) three dimensions that define a community of practice: mutual engagement, joint enterprise, and shared repertoire.

The subcategory of *collaborative culture* represents the members of the community in mutual engagement. This is demonstrated through the properties of the category. Collaboration (40 references from 10 sources) represents the buy in to trust each other and work together instead of alone.

Interdependent (11 references from 4 sources) carries the togetherness of collaboration a step further by representing the connectedness of the community members.

...we then need to look at our hiring practices and how do we make sure we are hiring people who are highly collaborative and who are committed to this kind of work. So, over the course of 14 years, every year it's just developed and I think it's just been driven more and more deeply into the culture of the district.

This connection is not just a horizontal connection across all teachers in a particular grade or who teach a particular subject, it is also vertical connections between the grade levels so that 4th grade teachers are dependent upon what 3rd grade teachers teach just as they are responsible to 5th grade teachers.

...it's not just elementary ... I just had meetings with the Middle School. So we are doing vertical. I just met with Middle School, and Middle School has been meeting with High School, so it's not even just the horizontal community, we're also doing a lot of vertical to say what do these kids need to have when they come to you? What are you seeing that they are lacking that we can go back and say, hey what are we missing in our program that needs to go there?

Know what we need to do together (2 references from 2 sources) represents the buy-in to the focus of their practice being learning as opposed to teaching. Cohesive (2 references from 1 source) represents the bond that is formed through their mutual engagement.

We like to call ourselves 'The Dream Team' because it's a very cohesive group that we all work well together. We all share and help and can ask questions.

The subcategories of *accountability* (18 references from 6 sources) and *enactment* (11 references from 5 sources) represent the members in joint enterprise. The properties of *accountability* and *enactment* demonstrate the joint enterprise. Meetings (5 references from 3 sources) represent one of the methods by which community members hold each other *accountable* as they discuss student progress. Do the work of the PLC (6 references from 3 sources) represents the community members' *accountability* to make the change from teaching to learning. Planning (4 references from 2 sources) represents one of the tasks community members accomplish together to keep them *accountable*.

And if I had to go real general I would say that I love, love, love so many aspects about a professional learning community. Right off the bat, I love just that daily contact with my peers, the meetings that we have together. My partner and I, we meet almost daily. We have the same planning period. They've scheduled us so that we can meet regularly.

Within enactment, art and science (4 references from 2 sources) represents the balance a teacher strikes in her classroom to ensure students learn. Teachers use the science of learning to create learning experiences for their students, but they are also aware that good teaching is also an art. Trust (2 reference from 2 sources) represents incorporating other teachers' techniques into your practice as well sharing your students with other teachers.

Each teacher has their own creative way of teaching and instructing students. So tight on what you're going to have the students learn and what you're going to respond to if they don't. Loose on how you get there. That's part of that art of teaching.

Creating knowledge (62 references from 11 sources) represents the members creating a shared repertoire. Shared meaning is a concept name that emerged through the researcher's theoretical sensitivity during Selective Coding (see Section 3.8.3) and which represents community members discussing and sharing all aspects of their practice so that their conversations are based on a shared understanding.

...that's another structure that's really important so that you can collaborate, because if you don't have a shared terminology or a shared understanding, it's going to be difficult to collaborate. You're going to be comparing apples to oranges. And it's going to be difficult to have that system of support in place.

Learn from each other (2 references from 2 sources) represents the community's ability to make PLC activities imbedded professional development.

And so we went through the process of just trying to recreate the units to make it problem solving - find the problem, research the problem. Do all the steps. We really had to work together to learn from each other.

No topic is off the table. Discussions (27 references from 9 sources) represent those conversations.

...we are still doing, in our corporation, discussion. And so our teachers and our administrators come together. We actually do that once a month, which I think is pretty exciting. So we ... things are sent to them saying, 'Hey, here's a need. What are we going to do about it?' It starts a discussion.

Coach (6 references from 5 sources) represents understanding in context. That is, even though there are community members with the title of 'coach', anyone in the community can take on this role, because everyone in the community is in the same context. In all of these activities, a shared repertoire is created and sustained.

4.1.5.2. Axial Coding of Community

Collaborative culture is a **causal condition**. It is this culture that allows the community to function. The community must be **mutually engaged** in their practice to eliminate silos and cynicism, to create interdependence, and define the focus of their practice. Practice "exists because people are engaged in actions whose meanings they negotiate with one another (Etienne Wenger, 1998, p. 73)."

Accountability is also a **causal condition**, because the joint enterprise of the **community** "creates among participants relations of mutual *accountability* that become an integral part of the practice (Etienne Wenger, 1998, p. 78)." The properties of *accountability* (sharing, meetings, planning, do the work of the PLC) all embody and facilitate the mutual *accountability*. When teams of teachers plan, assess, and do the work of the PLC, they have regular meetings that support the mutual accountability. However, when teams of teachers are not accountable to each other to do the work of the PLC, but plan and assess and meet, a certain amount of cynicism develops. The activities that create and draw on the mutual accountability are seen as ways to meet someone else's expectations as opposed to making the mutual accountability part of the practice in which the teachers are engaging.

Enactment is an **action/interaction**, because it represents the actions of the community members in their joint enterprise that "is the result of a collective process of negotiation that reflects the full complexity of mutual engagement (Etienne Wenger, 1998, p. 77)." The properties of art and science, trust, and on the fly are the ways the **community** acts within the *collaborative culture of accountability* that has been established. They have

negotiated their response to their situation such that these are accepted ways of being and doing. As demonstrated in Figure 47: Interaction Matrix for Accountability and Enactment, when this negotiation has not occurred, the teachers continue to function in their classroom silos where they are king and they are confident in their teaching abilities, there is little trust between teachers, and very little changes.

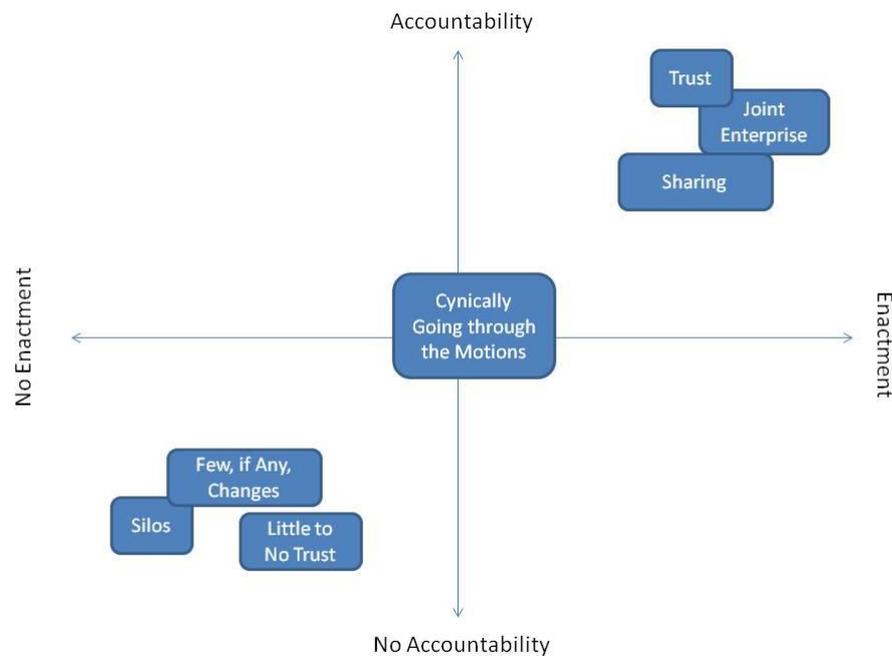


Figure 47: Interaction Matrix for Accountability and Enactment

Creating knowledge is an **intervening condition** as well. It represents the **community** building it's shared repertoire. "The repertoire of a community of practice includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice (Etienne Wenger, 1998, p. 83)." When the **community** is just forming the PLC activities are new, discreet changes in the way things are done. Once they have developed a habit for *creating knowledge*, the activities become 'just the way we work.' Each district has a unique, shared repertoire of practice that comes from shared ideas, terminology, and understanding.

4.1.6. Category: Professional Development

The category of **professional development** (Table 26) represents the learning journey teachers travel as they change from being a district of

individual teachers to a community of practice focused on student learning. Within the PLC, **professional development** is both a change catalyst and a change support.

Since learning and professional development is so deeply imbedded in the functioning of a PLC, there is a significant difference in the number of reference to concepts such as *collaborative relationships* (20 references from 7 sources), *learning from each other* (48 references from 10 sources), and *job-embedded* (19 references from 8 sources) as opposed to *PD to develop PLC* (9 references from 6 sources). This might be because *PD to develop PLC* has a specific goal and the other three sub-categories are also part of the *PD to develop PLC* aspect of **professional development**.

Table 26: Professional Development

Subcategories	Properties	Dimensions
Job Embedded 19 refs 8 sources	Connected to student performance 3 ref 2 sources	Connected to data 2 refs 2 sources
	Art & Science 5 refs 3 sources	Work together to learn from each other 2 refs 1 source
	Direction 2 refs 2 sources	Drives the purpose 1 ref 1 source
		Make sense 1 ref 1 source
Mentor relationship 3 refs 2 sources	New teacher mentor 1 ref 1 source	
PD to Develop PLC 9 ref 6 sources	Drivers 4 refs 2 sources	Goals 1 ref 1 source
	Good teaching methods 1 ref 1 source	
	Change models 1 ref 1 source	
	Journey 2 ref 2 sources	Knowing what we need to do together 1 ref 1 source
Collaborative Relationships 20 refs 7 sources	Conversations convert information into knowledge 11 ref 6 sources	Support 10 refs 5 sources
	Talking about strategy 1 ref 1 source	
Learning from Each Other 48 ref 10 sources	Teacher-led 3 refs 3 sources	Expertise shared 2 refs 2 sources
	Coaching 17 refs 6 sources	Support 10 refs 5 sources

Subcategories	Properties	Dimensions
Job Embedded 19 refs 8 sources	Connected to student performance 3 ref 2 sources	Connected to data 2 refs 2 sources
	Art & Science 5 refs 3 sources	Work together to learn from each other 2 refs 1 source
	Direction 2 refs 2 sources	Drives the purpose 1 ref 1 source
		Make sense 1 ref 1 source
	Mentor relationship 3 refs 2 sources	New teacher mentor 1 ref 1 source
	Embedded by teachers 6 refs 3 source	Collaborative conversations 8 refs 4 sources
	Informal learning 5 refs 2 sources	

4.1.6.1. Description

The category of **professional development** consists of five sub-categories: *professional development to develop PLC, collaborative relationships, learning from each other, job embedded*. The subcategory, *job embedded* (19 references from 8 sources), represents various aspects of the change journey. This is demonstrated through the properties of *job embedded*. For example, connected to student performance (3 references from 2 sources) represents the locus of the learning and change. The **data** used to determine student performance is also the basis for evaluating teacher performance. One research subject said,

“I have also learned that you cannot explicitly teach what you do not explicitly know yourself.”

An effective teacher will always interrogate student data around concept understanding in terms of his/her own understanding. Art and science represents the practice aspect of teaching. While there is science around how we learn, the art of teaching is shared from one teacher to another.

Therefore, that whole professional development piece and that whole coaching piece is critical, because we have create shared understandings -- the art and science of teaching reading, the art and science of teaching writing, the art and science of teaching math -- all of those things are our focus in what WE ourselves are learning.

The *job-embedded* nature of **professional development** with in a PLC provides the direction for the **professional development**. That is, direction

represents the purpose and context of learning and connecting **professional development** to the day to day running of a classroom provides direction for the **professional development** through identifying specific learning needs of teachers within their own context which allows the teacher to make sense of the **professional development**.

Researcher: *maybe would it be fair to categorize that before you were just trying new things, hoping something would stick? Whereas now, as you search for the information, you're more directed with what you're looking for?*

Interviewee: *Yeah. I would say we're more directed. We have a purpose in what we're doing.*

Job-embedded professional development also creates mentor relationships for teachers – new and experienced. Rather than not having a mentor or possibly only one mentor, teachers have multiple mentors.

Maybe they're seeing it as that one person's job. Being that person versus being that PLC where everybody is kind of helpful to you in that way.

PD to develop PLC (9 references from 6 sources) represents the learning the district participates in to cast a vision of how to do “school” differently, to understand how to function together as a PLC, and to understand that it is a change journey (2 references from 2 sources) they will take together. Drivers (4 references from 2 sources) represent the goals for creating the PLC while good teaching methods (1 reference from 1 source) represent the goals the teachers set for learning as they define their curricula. Change models (1 reference from 1 source) represent the change from linear to non-linear thinking about change that occurs during the journey (2 references from 2 sources) to becoming a PLC.

...we had some teachers that really weren't buying into the new conceptual math piece and by me doing it with their students and seeing the excitement in those students faces and the things they were discovering all on their own. That is what changed those teachers minds and they've been making the transition and it's been going really well. That's where we've seen far more buy-in than any other thing we've done.

The third sub-category, *Collaborative relationships* (20 references from 7 sources), represent the essence of mentor relationships. That is, the conversations the teachers participate in become **professional development**. This is demonstrated through the property of conversations convert

information into knowledge, (11 references from 6 sources) which represents teachers incorporating information (either external or internal) into their specific context.

A huge piece in that we've got this combination of people coming in, who share knowledge with us, and it's not just a one-time shot. We create a collaborative relationship with them. I'm going to spend the next three days with Jan Richardson, and she is the author of Next Steps in Guided Reading.

Creating that shared understanding and terminology. It is also demonstrated through the content of those relationships and conversations. Talking about strategy (1 reference from 1 source) represents the concept that the *collaborative relationships* provide an opportunity to talk about what is happening in classrooms, and how to make student encounters more effective learning experiences.

So we are having conversations. basically, the biggest change is we're having conversations on reflecting on what we are doing in the classroom. And not being so, 'Oh my gosh that means I'm a bad teacher', because it doesn't. It's 'Wow! There could have been something that I could have done one little piece a little differently and then my kids would have understood it more.

The last sub-category *learning from each other* (48 references from 10 sources) represents the various ways the community comes together to support each other. This is demonstrated in the properties: teacher-led, coaching, embedded by teachers, and informal learning. In this context, teacher-led (3 references from 3 sources) represents the leadership role teachers take in sharing their expertise while coaching (17 references from 6 sources) represents types of support and how that support is provided. Embedded by teachers (6 references from 3 sources) and informal learning (5 references from 2 sources) together represent the collaborative conversations teachers have that enable *learning from each other*. One study participant summed it up this way:

We also, every Wednesday, have job-embedded collaboration time. Sometimes that collaboration time will be lead by a math teacher-leader. We do the 5 Easy Steps to a Balanced Math Program in <study district>, so they might be working on daily math review. They might be working on conceptual understanding; they might be working on math fact master; they might be working on a certain aspect of the 5 Easy Steps and increasing their explicit understanding.

4.1.6.2. Axial Coding of Professional Development

Job-embedded and *drivers* are **causal conditions** in that they set the context for the professional development. When teacher learning is *driven* by district-wide student learning goals and teacher-driven curricula, professional development becomes *job-embedded*. This is when student performance and direction provide clear connections to what needs to be learned.

Collaborative relationships and *learning from each other* are **consequences** of these **causal conditions**. These concepts represent the **actions/interactions** between the teachers and administrators when **professional development** is *job-embedded* with specific *drivers* as shown in Figure 48: Professional Development Matrix. Therefore, when **professional development** is not *job-embedded* and does not have agreed upon *drivers*, teachers do not develop *collaborative relationships* nor do they have much opportunity to *learn from each other*. This is seen when teachers are left on their own to implement **professional development** through their own expertise and with little conversation with other teachers. It is difficult to create new strategies when you have no one with whom to discuss or implement ideas. In this environment, consulting a coach is one more task the teacher must add to her long list of daily tasks. This results in subject matter coaching being an ineffective way to improve student results. However, when the *drivers* are in place and **professional development** is *job-embedded*, teachers begin a shared journey that includes embedding sharing expertise into day-to-day activities. A signal that this journey has begun is when, through the process of becoming a PLC, teachers and administrators agree on specific teaching methods that will drive the design of their curricula. This allows teachers and administrators to create shared understanding and terminology. Now strategic conversations are bountiful and powerful, because everyone is speaking the same language, starting from the same place, and working together to ensure student success. Casual conversation now leads to shared expertise, informal learning, and change in practice that is just as powerful as the professional development event.

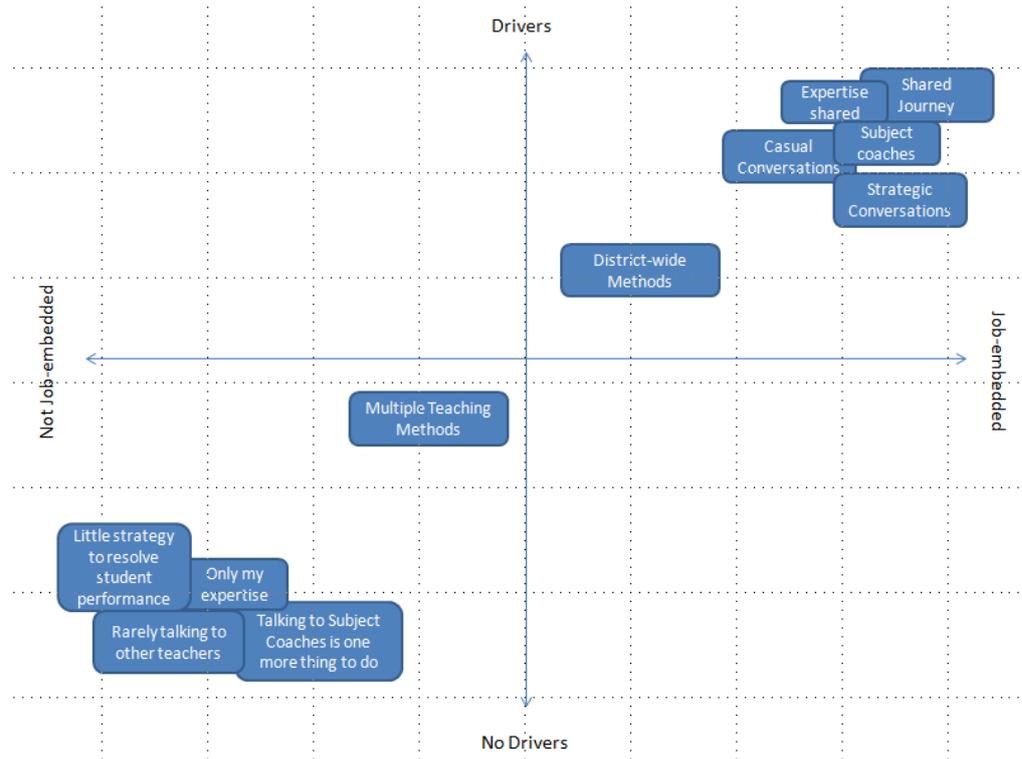


Figure 48: Professional Development Matrix

PD to develop PLC is a **causal condition**, because this involves specific learning about being a community of practice. While the source of this **professional development** is not the teachers or the students, the result of this particular PD is to bring understanding about the value of the PLC. Additionally, this learning begins moving the district from a linear change model to a non-linear change model. Much professional learning design is based on a linear model of change that starts with a professional development event and finishes with student improvement (see Figure 49: Assumed Linear Change Model) (Guskey, 1984). However, PLCs experience a non-linear change more along the lines of Clarke & Hollingsworth (see Figure 50: Interconnected Model of Professional Change) (Clarke & Hollingsworth, 2002).



Figure 49: Assumed Linear Change Model

The Change Environment

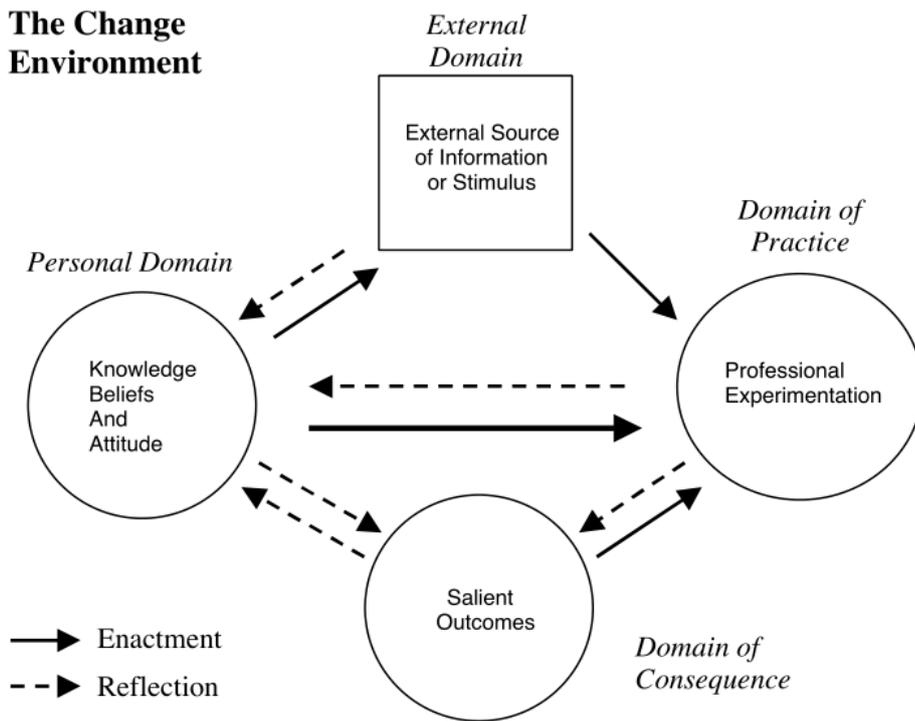


Figure 50: Interconnected Model of Professional Change

Learning to become a PLC starts with changing the district’s focus from teaching to student learning. It is during these professional development experiences that teachers learn the power of the framework questions to create a *systematic response* to the **focus on student learning**. Teachers discover that they are no longer expected to answer these questions on their own. The mechanisms for collaboration are instantiated into the teachers’ days and they begin to build the shared terminology and shared understanding necessary to work together. The two **causal condition** categories (*Job-embedded* and *Drivers*) and the two **consequences** categories (*Collaborative relationships* and *Learning from each other*) map to the Interconnected Model of Professional Change (see Figure 51: PD Sub-categories applied to the Interconnected Model of Professional Change). Creating the PLC sets the *drivers* for teacher learning at the feet of the students’ performance data thereby making the learning *job-embedded* via ‘professional experimentation.’ The properties of *collaborative relationships*, conversations convert information into knowledge and strategy, provide the reflection on enactment that connects ‘professional experimentation’ to ‘salient outcomes’ to ‘knowledge, beliefs, and attitudes.’ The properties of *learning from each other*, teacher-lead, coaching, embedded by teachers, and informal learning, provide the reflection on enactment that connects ‘knowledge, beliefs, and attitudes’ to ‘professional experimentation.’ Therefore, *PD to*

develop PLC is a critical intervention to set the stage for teacher learning to be a function of the community.

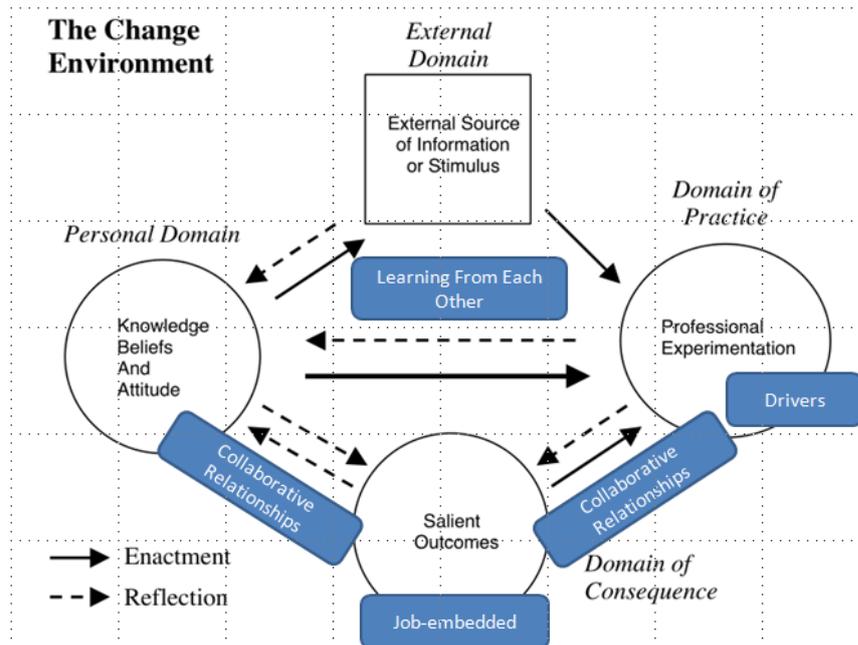


Figure 51: PD Sub-categories applied to the Interconnected Model of Professional Change

4.2. Axial Coding Between Categories

This section provides further detail about the relationships between categories and their subcategories.

4.2.1. Functional and Interpersonal Structures and Focus on Student Learning

The categories of **Functional and interpersonal structures** and **Focus on Student Learning** share a similar concept of 'systematic' action. In **functional and interpersonal structures**, system of support is a property of *policies, procedures, and practices*. It represents the manner in which the district makes the change to a PLC. That is, the district of teachers and administrators creates *policies, procedures, and practices* that become a system of support. In **focus on student learning**, systematic response represents the concept that in order to **focus on student learning**, one must take a systems approach to the teaching process. System of support is a **causal condition** that acts as a macro level 'systematic' action, because it

happens across the school district and its primary goal is to support the district change from focusing on teaching to focusing on student learning. Systematic response, on the other hand, is an **intervening condition** that acts as a micro level 'systematic' action, because it happens within and among the teachers and principals and its primary goal is to change teacher practice. As demonstrated in Figure 52: Interplay of Systematic Actions Between District and Teachers, when teachers attempt to change their practice (micro systematic response) without the *policies, procedures, and practices* (macro system of support), there is only limited change. Conversely, if *policies, procedures, and practices* attempt to change the teachers' practice by creating a system of support (macro level), but the teachers are not systematically responding (micro level) to that attempted change, the change is less likely to happen; probably because teachers have not bought into the change. When there is neither a system of support nor a systematic response, teachers stay in their silos and focus on their teaching. However, when both levels of systematic action are working together, teachers collaborate and change their focus from teaching to student learning. It is this co-dependence that ensures that **functional and interpersonal structures** are a function of the **community** as opposed to a top-down change implementation.

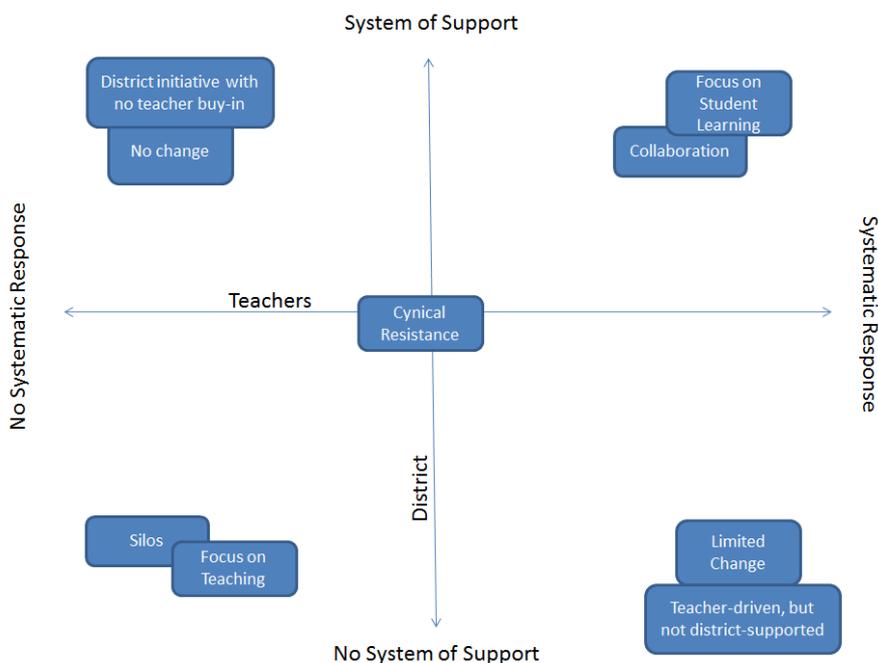


Figure 52: Interplay of Systematic Actions Between District and Teachers

4.2.2. Functional and Interpersonal Structures and Leadership

Functional and interpersonal structures and **Leadership** share a common concept: Central Office. Within **Functional and interpersonal structures**, Central Office is the function that creates and formalizes policies, procedures, and practices for the district. In the **Leadership** category, Central Office is a specific management role that plays a part in district **leadership** of the change. The Central Office in a school district plays a critical role in driving the change in focus from teaching to student learning. If the Central Office is driving the change, it needs to provide *policies, procedures, and practices* and **leadership** in such a way as to be part of the change process instead of separate from it. Whereas, if the change is being driven by the teachers or a building principal, the Central Office staff needs to be able to see the value and support it with at least *policies, procedures, and practices*.

4.2.3. Professional Development and Community of Practice

Professional development can be defined as: “Process of improving and increasing capabilities of staff through access to education and training opportunities in the workplace, through outside organization, or through watching others perform the job (*What is professional development? Definition and meaning*, n.d.)” This is the goal of the concept of **professional development** as well. A similar concept can be found as a sub-category of **community**: *creating knowledge*. One of the features of community, in a community of practice, is *creating knowledge*; Wenger (1998) calls this developing a shared repertoire. Therefore, **professional development** is a function of the **community** creating a shared repertoire. Professional development is the negotiation of learning, meaning, and identity within the **community** as the **community** transitions through three phases of change:

1. Phase 1 Change: Focus on Student Learning
2. Phase 2 Change: Form Community of Practice
3. Phase 3 Change: Maintain a Community of Practice Focused on Student Learning

4.2.4. Community Principles and Collaborative Culture

Community principles, a subcategory of **functional and interpersonal structures**, represent the **macro actions/interactions** that create **community** culture while *collaborative culture*, a subcategory of **community**, represents the micro **actions/interactions** creating a professional learning community. When the proper **functional and interpersonal structures** are in place, *community principles* encourage the *collaborative culture* formation within **community**. When the **community's collaborative culture** forms, and it is focused on student learning, teachers and administrators are able to create the best environment for learning. For example, appropriate student intervention and enrichment, support for teachers through each other, coaches, and professional development, and a true learning community.

4.2.5. Leadership and Community

Leadership represents **strategic actions/interactions** within **community**. Through modeling, reciprocal accountability, and visioning **leadership** works to create the *collaborative culture* in **community**. All four of the leadership tasks (McDonald & Savage, 2016) are made possible by the **causal conditions** of **functional and interpersonal structures** to form and sustain a community of practice focused on student learning.

1. Focus the enterprise on student learning instead of teaching methods to create a community of learners
2. Model the desired learning and collaboration behaviors across the enterprise to create reciprocal accountability and trust across the community
3. Build the community of learners by facilitating enterprise-wide process improvements:
 - a. Make changes to schedules and providing time blocks for teaching and collaboration
 - b. Be the link between the classroom and administration requirements
4. Create a coaching culture whereby sharing knowledge is valued to sustain the community

4.2.6. Leadership and a Community of Practice Focused on Student Learning

Leadership provides the strategic *actions/interactions* necessary for a **Community of Practice Focused on Student Learning** to form. **Community of Practice Focused on Student Learning** is the consequence of **functional and interpersonal structures** setting the framework for **leadership's** strategic *actions/interactions*; especially when the *intervening condition* of **professional development** and the *contextual condition* of **data** are present.

4.2.7. Data and Community of Practice Focused on Student Learning

Data represents a *contextual condition* for a **community of practice focused on student learning**. When the **community of practice focused on student learning** takes a *systematic approach* to learning that includes creating and using common pacing guides and common formative assessments , the resultant data provides the context for conversations that identify gaps in knowledge for students and teachers. When the gaps are identified for students, teachers and support staff are able to create plans to address the gaps. When the gaps are identified for teachers, schools and districts are able to provide job-embedded, context-specific professional development. Many times the teacher professional development is accomplished through casual conversations with other teachers. Sometimes it is accomplished through events organized within a school or district and lead by someone within the district. Once in a while the district will bring in an external source. However, even the external source can be customized to address a specific need in a custom manner.

4.2.8. Data and Professional Development

Data represents a *causal condition* for **professional development**. Data on how students are doing shines a light on what teachers are able to teach effectively. As one participant said, "I have also learned that you cannot explicitly teach what you do not explicitly know yourself." The primary district for this study held quarterly meetings of the leadership from all of the schools

to compare the results of their common formative assessments for the quarter. The participant said, “And then we create a structure of, okay one of the elementary schools is having amazing results--okay, what are you all doing? Are you doing something that we're not doing? How is it that you've gotten those amazing results?” These meetings identify potential gaps in teacher content or pedagogical knowledge.

4.3. Reflection on Interpretation and the Making of Meaning

As the analysis of the data led into creating concepts and identifying their patterns and relationships, attempts at making meaning out of the concepts definitely took on a “non-mathematical process of interpretation.(Strauss & Corbin, 1998, p. 11)” While the researcher struggled with the process of axial coding (see Section 3.7.7.3.1), the relationships between the categories, subcategories, and their properties did begin to form a theoretical schema.

Returning to the data to identify the number of times a code appeared aided in confirming the importance of the concepts and that their emergence to the level each rose was appropriate and supported the emerging theoretical schema. Some concepts were removed from the tables and descriptions (Table 27: List of Code Deletions).

Table 27: List of Code Deletions

Category	Number of concepts removed
Functional and Interpersonal Structures	2
Focus on Student Learning	1
Leadership	4
Data	1
Community	0
Professional Development	3

Overall, identifying the number of times a code appeared allowed the researcher to stand over the concepts chosen by:

- 1) Reinforcing the importance of the concept
- 2) Suggesting the relative importance of the relationships identified
- 3) Clarifying the relative position of a category or property within the schema

For example, in the category of **Focus on Student Learning**:

The properties of those subcategories also appeared fairly frequently in the data. This served to reinforce their importance as part of the category as well as the importance of the category itself.

Additionally, placing quotes from the participants in the descriptions of the categories confirmed that the concepts and their relationships to each other as they emerged from the data.

The Discussion and Conclusion that follows provide a brief overview of the emerging theoretical schema that led the researcher to be able to write the Theory in Chapter 5: Selective Coding and Theory Generation.

4.4. Discussion

The result of Open and Axial coding the six key categories, their sub-categories and properties and dimensions is the development of five statements of relationship that informed Selective Coding and Theory Generation. Those statements are as follows:

1. The category of **professional development** represents the learning journey teachers travel as they change from being a district of individual teachers to a community of practice focused on student learning. Within the PLC, **professional development** is both a change catalyst and a change support.
2. The category of **community** consists of four sub-categories identified as *Collaborative Culture, Accountability, Enactment, and Creating Knowledge* that represent Wenger's (1998) three dimensions that define a community of practice: mutual engagement, joint enterprise, and shared repertoire.
3. System of support (functional and interpersonal structures) is a **causal condition** that acts as a macro level 'systematic' action, because it happens across the school district and its primary goal is to support the district change from focusing on teaching to focusing on student learning. Systematic response (focus on student learning), on the other hand, is an **intervening condition** that acts as a micro level 'systematic' action, because it happens within and among the teachers and principals and its primary goal is to change teacher practice.

4. **Leadership** provides the strategic *actions/interactions* necessary for a **Community of Practice Focused on Student Learning** to form. **Community of Practice Focused on Student Learning** is the consequence of **functional and interpersonal structures** setting the framework for **leadership's** strategic *actions/interactions*; especially when the *intervening condition* of **professional development** and the *contextual condition* of **data** are present.
5. When **data** does not drive instruction and it is gathered neither *commonly nor formatively*, gaps are not identified accurately, teachers are defensive about their teaching skills, and students needs are not met.

The impact of these statements on the emerging theory is discussed in more detail in Section 5.2.1.

4.5. Conclusions

There are six key categories, but five key relational statements. This is primarily because the third statement combines the functional and interpersonal structures and focus on student learning categories. These five relational statements and continued analysis of the data led to defining the theory in terms of three, distinct phases that create and sustain teacher change in practice that improves student performance. In the next chapter (wherein I provide a narrative of the theory) it will become apparent that, as a result of rearranging the key categories into three, separate phases, their position in Strauss and Corbin's Axial Coding Paradigm (see Sections 5.2.2, 5.2.3, and 5.2.4) changes by phase and may not reflect the descriptions in this section.

Chapter 5: Selective Coding and Theory Generation

This Chapter provides the key concepts and detailed results that allowed the researcher to move from Axial Coding to Selective Coding and Theory Generation. This transition did not result in a theory with one Central Category supported by the rest of the categories to create a theory with explanatory and predictive power. Rather, the transition resulted in a theory consisting of three phases that used a different key category as the consequence for each phase and was explained by subcategories from the various categories. In addition, the transition to a theory provided the opportunity to overlay communities of practice theory on the emerging theory to describe how the PLC (as a specific type of community of practice) learns and changes.

In this Chapter is found:

- The results of Selective Coding that include the final key categories, sub-categories, properties and dimensions.
- The Theory of Phase Change in PLC Development
- Analysis of the process and structure of the three phases of the theory
- Use of literature in theory development
- Conclusions

5.1. Data Become Theory

As presented in Section 3.7.7.3.1, the researcher struggled with identifying relationships between subcategories and their properties and dimensions during the axial coding process. However, once she understood what sort of relationships were within her data, she was able to identify six distinct categories and their subcategories and clearly delineate the contextual and process relationships between them (see Chapter 4: Open and Axial Coding). The categories and subcategories that those rounds of analysis identified are listed below in Table 28: Categories and Subcategories after Open and Axial Coding:

Table 28: Categories and Subcategories after Open and Axial Coding

Category	Subcategories
Community	Accountability Collaborative Culture Creating Knowledge Enactment
Data	De-personalizes Drives Instruction Common Formative Assessment
Focus on Student Learning	Change in Practice Meeting Needs Systematic Response
District Policies and Community Principles	Community Principles District Policies, Procedures, and Practices
Leadership	Central Office Coaching Culture Creating Knowledge Principal is Key
Professional Development	Collaborative Relationships Job-embedded Learning from Each Other PD to develop PLC

A key relational statement emerged during the transition from Axial Coding to Selective Coding:

Professional development is the negotiation of learning, meaning, and identity within the **community** as the **community** transitions through three phases of change:

- Phase 1 Change: Focus on Student Learning
- Phase 2 Change: Form a specific type of Community of Practice
- Phase 3 Change: Ongoing Course Corrections to Ensure Students Learn

This insight about the role professional development played in the processes is what made the researcher settle on the theoretical scheme being an outline of the best-case activities that moved a school district from its current structure and process to a school district that functioned as a PLC.

When the researcher wrote the storyline of the emerging theory as a three-phase process, the relationships between the sub-categories with their

properties and dimensions fit and worked. The researcher was able to use at least one subcategory within each paradigm aspect of the phase process. This is where the power of the concepts to elaborate and predict became evident. The final list of the categories and subcategories looked like this:

Table 29: Categories and Subcategories of the Theory

Category	Subcategories	Phase
Community	Accountability	1
	Collaborative Culture that Functions as a Community of Practice	2
Data	De-personalizes	2
	Drives Instruction	3
	Common Formative Assessment	2
Focus on Student Learning	Normalizing Change in Practice	2
	Systematic Response to Focus on Student Learning	1
Functional and Interpersonal Structures	Community Principles	2 and 3
	District Policies, Procedures, and Practices	1 and 3
Leadership	Central Office	1
	Coaching Culture	2
	Maintaining a Regime of Competence	3
	Principal is Key	2
Professional Development	Collaborative Relationships	2
	Job-embedded Learning from Each Other	3
	PD to develop PLC	1
Community of Practice Focused on Student Learning*	Creating Knowledge (originally part of Community)	3
	Enactment (originally part of Community)	3
	Meeting Needs (originally part of Focus on Student Learning)	3

A column, identifying the phase within which the concept emerges, has been added, because it is difficult to understand the relationships of these concepts without knowing where they fall in the phases. The last category of the above table (Table 29: Categories and Subcategories of the Theory), Community of Practice Focused on Student Learning, identifies the overarching concept that completes phase three and which is the combination of subcategories (with their properties and dimensions) from Community and Focus on Student Learning.

5.2. Theory of Phase Change in PLC Development

Effective Professional Learning Communities arise through a three-phase development process. The first phase is primarily about changing teacher practice from teaching to learning. There are several PLC activities that help teachers discuss and define their new practice that results in a focus on student learning. Once this focus normalized, the activities started in phase one (e.g., answering the Four Critical Questions) establish the environment needed to create a community of practice in phase two. That is because phase two actions/interactions are the collaborative conversations that these activities (e.g., answering the Four Critical Questions) drive. Teachers are constantly negotiating meaning about what they are doing and how they are doing it. At the core of this phase are the conversations about Common Formative Assessment results. These conversations are wholly focused on learning – both student and teacher. Once the district or school is focused on student learning and has developed a community of practice around that focus, they move into phase three where their practice now requires them to constantly question what they are doing and whether there is a better way to do it; thereby maintaining the focus on student learning.

This theory identifies the ideal state for these changes. That is, this theory describes the conditions and their relationships to each other that enable a community of practice focused on student learning to form. While the theory itself developed through the inclusion of non-ideal examples, the description that follows does not specifically mention the consequences of non-ideal conditions or actions/interactions. Rather it focuses on the ideal state of the conditions and actions/interactions that are needed for the creation of a community of practice focused on student learning.

The theory outlines the conditions, actions/interactions, and consequences of three phases of change as the school district moves from a traditional organization to a Professional Learning Community. Within a particular phase, the categories, their subcategories, and properties perform specific functions to achieve that phase. These functions and the relationships between the categories, subcategories, and properties change as the district moves through the phases. The outcomes (or consequences) of the three phases can be visualized as shown below (Figure 53: Outcome of Three Phases Overview):

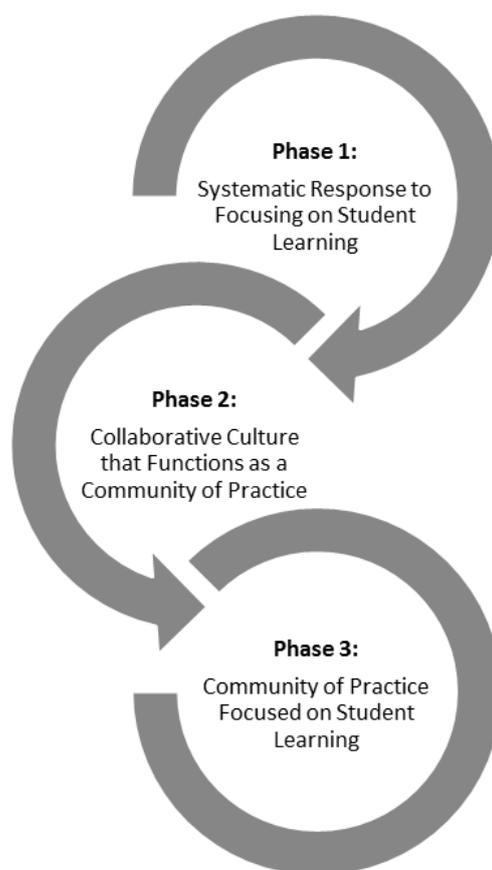


Figure 53: Outcome of Three Phases Overview

5.2.1. Key Relationships Between Concepts

As demonstrated in Section 3.7.8.2, the key relationships between concepts in each phase are discussed in terms of Strauss and Corbin's (1998) Axial Coding Paradigm. This visualization (Figure 54: Strauss & Corbin's (1998) Axial Coding Paradigm) starts with a causal condition on the left that supports the actions and interactions in the middle that lead to the consequence on the right. It also indicates that there are contextual conditions

and intervening conditions impacting the actions and interactions. The researcher used this visualization in order to make the relationships between the concepts clearer.

To aid in understanding how the concepts that emerged are connected through the grounded theory process, the following legend will assist the reader in distinguishing between theory concepts and grounded theory terms.

- **Emerging Theory Category**
- *Emerging Theory Subcategory*
- Emerging Theory Property
- Grounded Theory Terms from The Paradigm

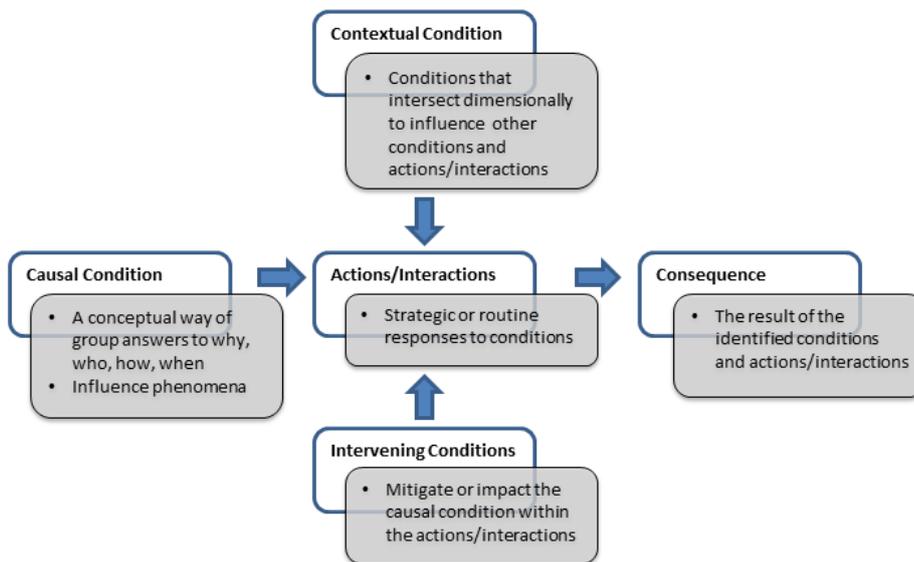


Figure 54: Strauss & Corbin’s (1998) Axial Coding Paradigm

5.2.2. Phase 1: Systematic Response to Focus on Student Learning

As Figure 55: Phase 1- **Focus on Student Learning** demonstrates, the concept of *professional development to develop a PLC* serves as the causal condition for the actions/interactions of creating and implementing *policies, procedures, and practices* that result in the consequence of **focusing on student learning**. This happens in the context of **community accountability** wherein members of the emerging **community** hold each other *accountable* for fully participating in learning and changing. *Central Office leadership intervenes* to suggest and support the changes, because they have the goal of changing the group mindset as their primary task.

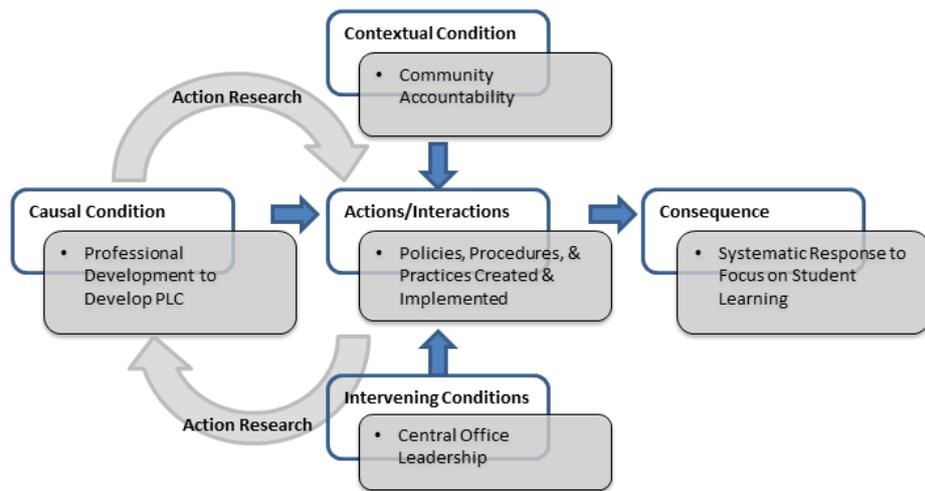


Figure 55: Phase 1- Focus on Student Learning

Professional development to develop a PLC is the causal condition of Phase 1, because changing the district’s practice from teaching to **focusing on student learning** must begin with learning a new way to do the practice of teaching; **professional development** becomes a driver for the change. The **professional development** events (e.g. PLC seminars, book studies, meetings, etc.) for Phase 1 are designed to create buy-in with the change in focus and then move the district from thinking about individual teachers to collaborative teams of teachers. These “events” are not typical professional development designs focused on changing individual behavior. Rather, as discussed in Section 4.1.6.2 (Axial Coding of Professional Development) they are designed to promote non-linear change and to begin negotiating meaning right from the start. For example, some activities that are conducted as professional development during this phase include:

- Learning about and creating mission and vision statements
- Learning about The Four Critical Questions [1) *What do the students need to learn?* 2) *How will we know if they have learned?* 3) *How do we intervene, if the students haven’t learned?* 4) *How do we accelerate learning for those who did learn?*] and deciding systemically how to address them
- Learning about the current, district learning standards and creating paced curricula to address them
- Learning about the Three Big Ideas (Learning, Collaboration, and Results) and determining how to implement them

All of these learning opportunities start with the introduction of new concepts that result in the negotiation of the meaning of the teachers' new joint enterprise.

Once the district has negotiated the meaning of their purpose and how they intend to accomplish that purpose, they turn to answering The Four Critical Questions. Individually, the questions focus the teaching staff on students. Collectively, the questions provide teachers a valid reason to work together. Answering them is a critical component of knowing what the teachers need to do together in this new joint enterprise. Answering them is also the beginning of mutual engagement and creating a shared repertoire.

Surrounding the *professional development to develop a PLC* for the Four Critical Questions is *professional development to develop a PLC* around the Three Big Ideas: Collaboration, Learning, & Results. These concepts help teachers understand why and how they will work together to answer the Four Critical Questions. Individually, they help teachers and district staff members understand the scope of the change wherein teachers, coaches, and support staff are no longer operating as individuals but as part of a whole whose sole purpose is to ensure students learn. Collectively, they are the core concepts for developing the community of practice that emerges during Phase 2. Unlike most **professional development**, which has a linear expectation of change in practice (Guskey, 1986), *professional development to develop a PLC* creates a non-linear relationship (Clarke & Hollingsworth, 2002) between the professional development events, teacher practice, and teacher knowledge and beliefs. When a district is in Phase 1, the causal condition of *PD to Develop a PLC* creates a non-linear change process to change the district's practice from teaching to student learning.

Creating and implementing *district policies, procedures, and practices* are part of that non-linear change. They are the actions/interactions for Phase 1, because in order to change the focus from teaching to student learning, *district policies, practices, and procedures* create the macro conditions needed to make the change. Only in Phase 1, *identifying and implementing district policies, procedures, and practices*, which allow the district to change its focus, is driven by the *Central Office*; these are the actions/interactions that define the joint enterprise in Phase 1. The decisions around these actions/interactions come from understanding how to use The Four Critical Questions and how to build the specific type of community of practice using

The Three Big Ideas. In phase 1, new *district policies, procedures, and practices* are initially determined by *Central Office* staff to create a system of support around how teachers will work with each other, how they will be hired and evaluated, and how their days will be organized. The key consequence of these changes is the elimination of silos which means teachers will no longer operate as 'solo artists' in the kingdom of their classrooms. Instead, they will have a system of support that includes a **community** of teachers, subject specialists, and administration. When *professional development to develop a PLC* is the causal condition, creating and implementing *district policies, procedures, and practices* are the actions/interactions of Phase 1 to create a practice **focused on student learning**.

The activity that ties the causal condition to the actions/interactions in all phases of the model is an implicit form of action research. The concept of action research was only mentioned explicitly one time. However, that concept rose in importance through its comparison to the rest of the data until it emerged as a concept that played a critical part in the process of the Professional Learning Community function. In this theory, action research represents the 'plan, enact, and reflect' aspects of the usual definition of action research. The 'plan, enact, and reflect' aspects are used at macro and micro levels in all three phases when the causal condition presents opportunities for action that are then planned for, enacted in the actions/interactions, and reflected upon to determine the value of the effort enacted. In Phase 1, the macro impact of action research is creating *district policies, procedures, and practices* that support teachers' abilities to answer the Four Critical Questions as they learn about them via *professional development to develop a PLC*. These are enacted and then reflected upon by the whole **community**/district to determine what works and why within the legal and social context of the school district. For example, in order to answer Questions 3 and 4 (3. *How do we intervene, if the students haven't learned?* 4. *How do we accelerate learning for those who did learn?*), some districts opt for creating specific time in the day when students and teachers get together for remediation and enrichment. Sometimes the time works and sometimes it does not. Action research cycles allow all participants to reflect on what worked or didn't work, determine why, and then create a new plan when necessary. New cycles of action research begin to fine tune existing contexts and create new ones as needed.

While the cycles of action research are refining the actions/interactions of creating and implementing *district policies, procedures, and practices*, **Central Office leadership** is intervening on those actions/interactions as well as the causal condition of PD to develop PLC. **Central Office leadership** is the intervening condition for Phase 1, because **leadership**, in this context, represents the *Central Office's* ability to influence change that creates *district policies, procedures, and practices*. It takes the *Central Office* administration, with the blessing and backing of the Board of Education, to begin this journey as well as to identify the core competencies needed to change the focus and create the new joint enterprise. The consequence of this work is a clear vision that helps distribute **leadership** throughout the **community** in later phases. At first, **leadership** is enacted as it is generally understood (i.e., a role to play within a group). It takes **Central Office leadership** to transform the vision of **focusing on student learning** into a function of the **community**. Therefore, **Central Office leadership** is not a function of a group of actors in Phase 1 but is an intervening condition on the actions/interactions of the *Central Office* as they create *district policies, procedures, and practices*. In Phase 2, **leadership** becomes a function of the **community** as opposed to a role within the **community**. When *professional development to develop a PLC* is the causal condition for the actions/interactions of *district policies, procedures, and practices*, **Central Office leadership** acts as an intervening condition to incorporate **professional development** outcomes into the development of *district policies, procedures, and practices* thereby creating the macro conditions needed for the change to **focusing on student learning**.

When **Central Office leadership** is functioning properly, the *Central Office* staff members model community building behaviors and seek to understand, through collaboration with teachers and other staff, the system changes needed to support implementing the Four Critical Questions and the Three Big Ideas. The primary task of **Central Office leadership**, in Phase 1, is to focus the enterprise on student learning instead of teaching methods. Using The Four Critical Questions to drive the focus, **Central Office leadership** works to create a **community** of learners and define the joint enterprise. **Central Office leadership** intervenes on the actions/interactions of creating *district policies, procedures, and practices* by

- 1) using what is being learned through *professional development to develop a PLC*
- 2) working with unions to change teacher contracts,

- 3) working with teachers to focus their methods, and
- 4) working with principals to communicate the vision that leads to the **focus on student learning**.

While *Central Office leadership* is intervening to clear the way for creating *district policies, procedures, and practices* to support the joint enterprise, *professional development to develop a PLC* is driving the definition of the joint enterprise of **focusing on student learning**. The result of these activities is shared meaning through shared understanding and terminology that impacts **community accountability**. **Community accountability** includes deciding “what matters and what does not, what is important and why it is important, what to do and not to do, what to pay attention to and what to ignore, what to talk about and what to leave unsaid, what to justify and what to take for granted, what to display and what to withhold, when actions and artifacts are good enough and when they need improvement or refinement. (Etienne Wenger, 1998, p. 81)” Therefore, **community accountability** is the contextual condition of *district policies, procedures, and practices’ actions/interactions* within the **community** as it works toward the consequence of **focus on student learning**.

Community accountability begins with learning about the Four Critical Questions and what they will mean for how teachers will teach. In Phase 1, **professional development** helps teachers understand how to create curriculum and pace it in order to answer Question 1 (What will students learn?), It also teaches them to write common formative assessments so they can answer Question 2 (How will we know if they have learned it?). The teachers and administrators negotiate the meaning of these activities and begin to define ‘what to do and not to do, what to pay attention to and what to ignore.’ Through these learning experiences teachers begin doing the work of the PLC to develop a shared understanding of what and how they will teach as well as shared terminology when discussing what they do. **Community accountability** becomes an imbedded aspect of the practice. “As a result, it may not be something that anyone can articulate very readily, because it is not primarily by being reified that it pervades a community. (Etienne Wenger, 1998, p. 81) **Community accountability** supports building shared repertoire and mutual engagement thereby defining what membership in the community will mean and what practice mastery will look like when the community of practice forms. Again, during Phase 1, *professional development to develop a PLC* is the causal condition that begins the process of forming the contextual

condition of **community accountability** during the change to **focusing on student learning**.

The consequence of Phase 1 is the whole district is **focused on student learning**. Answering the Four Critical Questions creates a *systematic response* for **focusing on student learning** and action research is the method by which the actions/interactions are enacted and evaluated. In Phase 1 the focus is on the Four Critical Questions, but implicit action research cycles (at the micro level) begin to take shape as a result of answering the Four Critical Questions. As shown in Figure 56: Action Research Cycles, ensuring the Four Critical Questions are answered walks the teachers through at least two cycles of action research. The first question is: “What do we want students to learn?” Creating pacing guides answers this question and creates the action research ‘plan.’ Teaching the planned standards is the ‘act’ step of action research. The second question is: “How will we know when each student has learned it?” Creating *common formative assessments* answers this question and provides **data** for the ‘observe’ stage. Questions three and four can be summed up as: “How can we improve on current levels of student achievement?” This is the ‘reflect’ stage of action research. Teachers use the *CFA data* to inform their reflection and guide the new plan that starts the next cycle of action research. In this way, **focus on student learning** redirects action research in the service of student learning as the 3rd cycle moves on to new learning goals and standards.

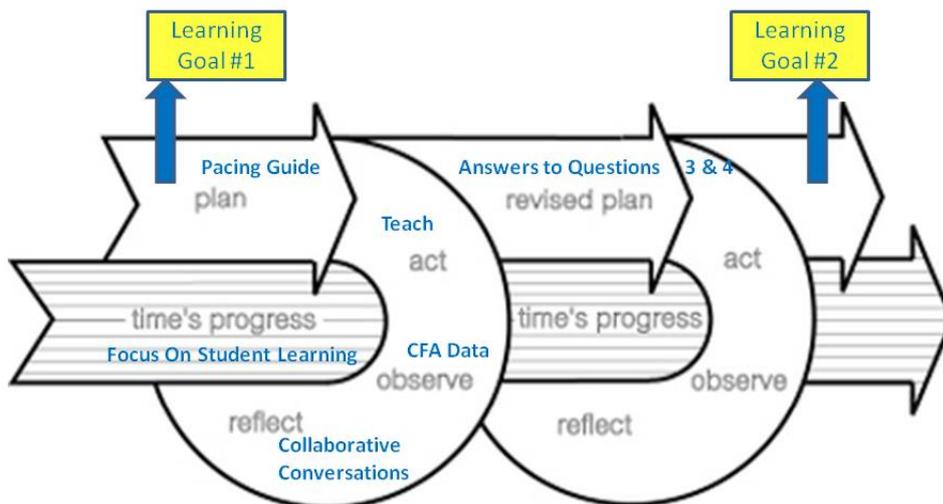


Figure 56: Action Research Cycles

Therefore, within the concept of *systematic response*, the Four Critical Questions represent the causal condition for the whole district actions/interactions using action research methods to create and implement

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pacing guides and common formative assessments that intervene to create the consequence of **professional development** connected to student learning.

At this stage the district has made the change in **focus** from teaching to **student learning** . Teaching methods are one component used in the service of ensuring student learning as opposed to the only component. There are now macro district policies defining the macro *system of support* as well as a micro *systematic response* to ensure the district is **focused on student learning** . The context of the practice has changed from individual to community and accountability to each other has been established. *Central Office leadership* is in place to influence policies and community ethos to keep the district **focused on student learning** .

In summary, Phase 1 begins with *PD to develop PLC* as a causal condition . The district utilizes specific **professional development** events (e.g. PLC seminars, book studies, meetings, etc.) that begin the negotiation of meaning by creating the vision of the change and identifying the joint enterprise the district will undertake. In Phase 1, *district policies, practices, and procedures* represents actions/interactions that create the *system of support* for the mutual engagement of **community** . **Community** , in this phase, represents the context condition of *accountability* of everyone within the district to begin the change. The *central office leadership* represents an intervening condition to **focus the enterprise on student learning** instead of teaching methods to create a community of learners. Therefore, when you have *PD to develop a PLC* providing the causal conditions for creating the actions/interactions of implementing *policies, procedures, and practices* and **leadership** intervenes to change the district's focus within the context of **community accountability** , the consequence is a *systematic response* to **focusing on student learning** . **Data** does not play a role in Phase 1, because there is no student assessment during Phase 1.

5.2.3. Phase 2: Collaborative Culture that Functions as a Community of Practice

As Figure 57: Phase 2 – Form a Specific-type of Community of Practice demonstrates, this phase begins with the **community** *normalizing the change in practice* from focusing on teaching to **focusing on student**

learning. *Normalizing change in practice* is the causal condition that feeds the *collaborative relationship actions/interaction* that leads to the specific type of community of practice forming. The *collaborative relationships* that *normalize change in practice* do so within the context of *community-developed principles* of behavior. Intervening into these *collaborative relationships* are:

- *Common Formative Assessment (CFA)* data that provides the starting point of the conversations to make meaning
- *Principals* providing **key leadership** by modeling behavior and providing support that ultimately distributes leadership throughout the community
- *Coaching Culture Leadership* (the concept of transformational leadership) encouraging and modeling a coaching culture among all members of the community

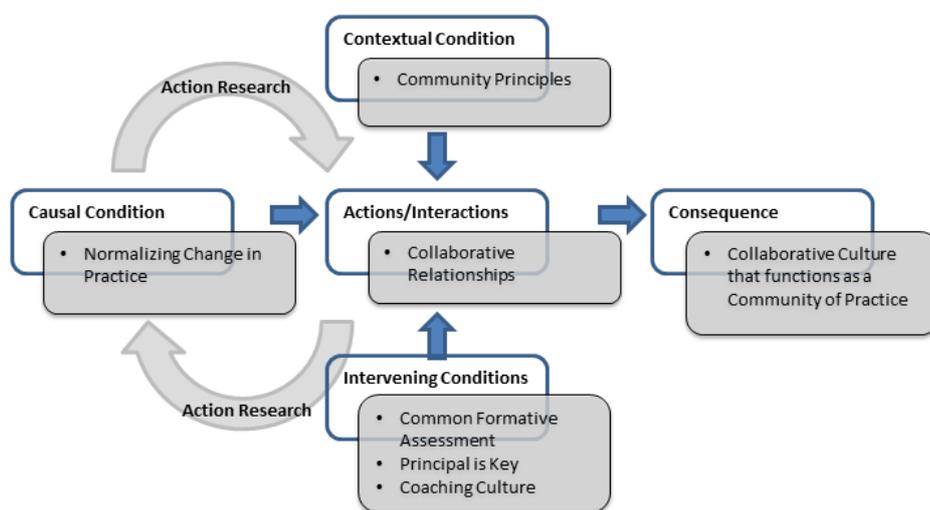


Figure 57: Phase 2 – Form a Specific-type of Community of Practice

For Phase 2, *normalizing change in practice* is the causal condition of the phase, “because the world is in flux and conditions always change, any practice must constantly be reinvented, even as it remains the same practice. (Etienne Wenger, 1998, p. 94)” Teachers have learned about what they need to do to **focus on student learning** in Phase 1. In Phase 2, teachers put into practice what they learned and begin the process of *normalizing change in practice*. That is, underneath everything that happens in Phase 2, is the idea that the district’s practice will forever be in a state of change. Therefore, the *collaborative relationship action/interactions* need to identify ways to both create and manage change. This is part of the shared repertoire they build and is uniquely theirs as they accomplish their joint enterprise. This change requires teachers to act/interact with other **community** members (mutual

engagement) to negotiate meaning in all aspects of their practice instead of leaving teachers to their own devices in their own classrooms. These requirements are driven by the actions/interactions of district policies identified in Phase 1. Teachers have begun the joint enterprise of creating and pacing curriculum together through mutual engagement. They have begun using *common formative assessments* (CFA). Teachers are meeting regularly to talk about the curriculum, data, and how curriculum and data impact their teaching practice as part of the Phase 1 district policies. These are the first steps in *normalizing change in practice*.

Normalizing change in practice activities described above drive the *collaborative relationships* actions/interactions that are both change drivers and **professional development**. "Practices evolve as shared histories of learning. (Etienne Wenger, 1998, p. 87)" The 'shared history of learning' begins in Phase 1 as teachers begin to learn how to **focus on student learning** through writing pacing guides and CFAs. In Phase 2, the new shared repertoire is the basis of *normalizing change in practice*. These *collaborative relationships* actions/interactions in the change process involve creating shared meaning about how to approach the standards to be taught, reflection on the effectiveness of a particular approach based on the CFA results, and discussing and identifying strategies to address student learning gaps. Most often, these conversations happen only among the teachers, coaches, and administrators. However, sometimes the **community** realizes it needs more support. In these cases, consultants are brought in to deepen teacher understanding of a concept (pedagogical or content). These consultants are frequently positioned as one more collaborator in the *collaborative relationships* thereby ensuring a common context for the learning. All of these are opportunities to learn more, deepen existing learning, and identify gaps in understanding. Wenger (1998, p. 95) states learning in practice involves:

- Evolving forms of mutual engagement
- Understanding and tuning their enterprise
- Developing their repertoire, styles, and discourses

When *normalizing change in practice* **focused on student learning** is a causal condition, *collaborative relationships* provide the opportunity for **professional development** by creating a shared history of learning through mutual engagement, joint enterprise, and a shared repertoire.

For the **community** to get the maximum value from the causal condition driving actions/interactions, action research (via implicit plan, enact, and reflect processes) provides cycles of reflection and redirection. In Phase 2, the macro impact of action research involves the district's *normalizing change in teacher practice* such that joint enterprise and mutual engagement require the regular review, reflection and discussion of the practice. This reflection takes place within *collaborative relationships* that develop shared repertoire. In Phase 2, this takes many forms. One example might be the district determining a standard methodology for teaching mathematics. Some teachers might be familiar with the methodology while others are not. Yet the focus on student learning developed in Phase 1 is *normalizing change in practice* in Phase 2 so that there's a *systematic response* to incorporate the methodology. This is primarily done by creating pacing guides through *collaborative relationships* across the grade/subject groups. The pacing guide is *enacted* (taught), the impact is evaluated, and decisions are made about how to improve. The *systematic response* allows teachers to identify their own weaknesses and seek out expertise. Expertise might be found working one-on-one with a subject matter coach, working with a grade/subject expert in a group learning environment, or simply through the informal conversation of two or more colleagues as they discuss *CFA* results. The outcome of this action research cycle is the definition of the regime of competence for the community of practice.

During Phase 2 there are several conditions that intervene in the forming of a regime of competence. One of those intervening conditions is **Data**, in the form of the results of *Common Formative Assessments (CFAs)*, which intervenes in the change process as it feeds into the collaborative relationships actions/interactions. *CFAs* become part of the community's shared repertoire when *CFA* results are the basis for team conversations as they answer the question of whether students have learned what teachers set out to teach. *CFA* results ensure collaborative conversations are **focused on student learning** thereby creating rigor in the *systematic response* and ensuring the establishment of joint enterprise. They are the starting point for making intervention and enrichment decisions. However, without the appropriate *district policies, procedures, and practices* that allow time for intervention and enrichment, the *CFA* results lose their power to ensure student learning. When *CFA* results are actionable and intervention time is available, the perception of power to improve student learning embodied in the **data** increases and joint enterprise thrives.

CFA data intervenes in the *collaborative relationships* that create **professional development** by providing a reason for Teacher A to ask Teacher B what she did differently that would result in her students doing so much better on the *CFA* than Teacher A's students thereby depersonalizing the conversation. No one is telling teacher A how to teach better; she is seeking out ways to be better at what she does. These conversations highlight gaps in understanding when several teachers' students struggle to grasp a concept. Now teachers and administrators have identified a specific skill for which teachers need support and it is the teachers asking for the support rather than administration insisting on some general, one-size-fits-all training. Additionally, the support that is provided is for the specific context within which the teachers are operating. Some of this specific support may come from district subject matter experts (e.g., reading coaches, math leaders, Response-to-Intervention teachers, etc.) or from external sources (e.g., professional development companies, university courses, consultants, etc.). As a result of *district policies, procedures, and practices* enacted in Phase 1, district subject matter experts frequently sit in on the collaborative conversations to discuss *CFA data* and can provide support on the spot in a completely informal manner. When *CFA data* is available to use in a formative manner, it is an intervening condition on the actions/interactions of *collaborative relationships* that are essentially **professional development**.

Another intervening condition in Phase 2 is **leadership** in the forms of the *principal is key* and *coaching culture*. In Phase 2, *principal is key* represents a **leadership** role that is pivotal in distributing leadership from the *Central Office* throughout the **community** through sharing the vision of **focusing on student learning** and leading by doing (modeling) what is expected of others to create an environment of trust through reciprocal accountability. In Phase 2, principals work closely with teachers to understand what the teachers need in order to **focus on student learning**. In the process they provide reciprocal accountability by not asking the teachers to do anything the principal isn't willing to do. This could be activities like participating in meetings to create pacing guides, meeting to discuss *CFA* results, and working with subject matter experts to ensure the best result for students. When the teachers begin to behave this way, they take ownership in the practice and help lead the change.

Coaching culture also shares the vision for **focusing on student learning** by modeling appropriate collaborative behaviors: 1) being willing to

share what you know; 2) being willing to admit what you do not know. These **leadership** concepts ensure that **leadership** is not a specific role or responsibility; rather it becomes a function of the **community**. **Leadership models** the desired learning and collaboration behaviors across the enterprise to create reciprocal accountability and trust across the **community**.

*Principal is key and coaching culture intervene in collaborative relationships actions/interactions via their modeling dimensions. As teachers begin meeting to plan curriculum pacing and discussing CFA results, principals and teacher leaders need to model appropriate behaviors. These include staying focused on the students learning as well as reflecting on better ways to work. This is where the organizational learning skill of systems thinking comes into play. Some of the actions/interactions of the *collaborative relationships* result in identifying different ways to accomplish student learning. A key leadership task is:*

- Build the community of learners by facilitating enterprise-wide process improvements:
- Make changes to schedules and providing time blocks for teaching and collaboration
- Be the link between the classroom and administration requirements

When you have the concept of **leadership intervening** in *collaborative relationships* the result is *normalizing change in practice* that creates mutual engagement, joint enterprise, and a shared repertoire.

In Phase 2, *community principles* are the contextual condition of *collaborative relationships*. *Community principles* create the micro conditions that work with macro *district policies, procedures, and practices* to provide collaborative structure for the interpersonal relationships. *Community principles* are components of mutual engagement – “expectations about how to interact, how people treat each other, and how to work together (Etienne Wenger, 1998, p. 152).” In Phase 2, the primary community principle is keeping the PLC mindset foremost in a teacher’s thinking and actions. Managing interpersonal politics, while working in a collaborative structure to align curriculum, work with counselors, and ensure student access to teachers: these are *community principles* that set the contextual conditions for mutual engagement in creating a joint enterprise of **focusing on student learning** that is at the heart of *normalizing change in practice* that drives the *collaborative relationships* and learning.

The contextual condition of *community principles* influences the actions/interactions of *collaborative relationships* by providing the interpersonal focus, structure, and rules for the interactions. *Community principles* pair with the *district policies, procedures, and practices* to define expectations of how the system works as well as how **community** members will work within the system—micro and macro conditions. Creating *community principles* during Phase 2 means that the *collaborative relationships* at the heart of the actions/interactions provide opportunities for teachers, and other district staff members, to learn from each other. It is *community principles* that help teachers understand how to talk about CFA results. Rather than focusing on the quality of the CFA questions, *community principles* provide guidance about keeping the focus of the conversation on the students' learning. *Community principles* are the drivers for encouraging **leadership** responsibilities among teachers. *Community principles* work together with the intervening leadership conditions and principals demonstrate appropriate behavior and then encourage teachers to behave in the same way. *Community principles* ensure that a *coaching culture* develops by making it acceptable for teachers to admit when they do not understand something. Mutual engagement becomes the norm. When the community creates *community principles*, they function as a contextual condition of the actions/interactions inherent in *collaborative relationships* thereby creating mutual engagement.

The joint enterprise was defined in Phase 1 through mutual engagement. In Phase 2, the mutual engagement developed a shared repertoire and the consequence of *normalized change in practice* in Phase 2 is a **community** with a *collaborative culture* that functions as a community of practice. “The development of practice takes time, but what defines a community of practice in its temporal dimension is not just a matter of a specific minimum amount of time. Rather, it is a matter of sustaining enough mutual engagement in pursuing an enterprise together to share some significant learning. (Etienne Wenger, 1998, p. 86)” Functioning as a community of practice is a critical piece of the overall change process. Without a community of practice, hoarding knowledge still provides power and prestige, **community** members remain in their classroom silos, and PLC activity is seen as separate from day-to-day functioning thereby limiting learning within the **community**. However, the consequence of Phase 2 conditions and actions/interactions is the creation of a community of practice where sharing knowledge provides power and prestige, community members

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collaborate with teachers in other classrooms, and PLC activity is “just how we work.”

Therefore, the causal condition of Phase 2 is *normalizing change in practice* as all **community** members understand the joint enterprise they are undertaking – **focus on student learning**. In Phase 2 **professional development** represents the actions/interactions within the district in the form of *collaborative relationships*. The *district policies, procedures, and practices* that created the actions/interactions in Phase 1 make room for *community principles* as the contextual condition for the actions/interactions of the *collaborative relationships* in Phase 2. **Data** enters the equation to represent an intervening condition of those *collaborative relationships* as teachers discuss the results of the *common formative assessments (CFAs)* and try to answer questions three and four (What will we do to remediate the students that didn't learn? and What will we do to enrich the students who did learn?). *Principal is key* and *coaching culture* represent intervening conditions of **leadership**. These concepts represent specific leadership tasks in Phase 2:

- Model the desired learning and collaboration behaviors across the enterprise to create reciprocal accountability and trust across the community
- Build the community of learners by facilitating enterprise-wide process improvements:
 - Make changes to schedules and providing time blocks for teaching and collaboration
 - Be the link between the classroom and administration requirements

That is why, when you have *normalizing change in practice* to **focus on student learning** providing the causal conditions for *collaborative relationships* actions/interactions with **data & leadership** intervening to facilitate the conversations that convert information into knowledge and create strategy, the consequence is a *collaborative community culture* with all of the markings of a community of practice, albeit a community of practice specific to professional learning communities.

5.2.4. Phase 3: PLC Community of Practice Focused on Student Learning

In Phase 3, **functional and interpersonal structures** create the causal condition for maintaining a regime of competence actions/interactions. *Job-embedded learning* from each other intervenes on these actions/interactions as the tension between competence and experience requires learning and teaching among **community** members. This is activity is based within the contextual condition of **data driving instruction** to result in a community of practice **focused on student learning**. See Figure 58: Phase 3 – PLC Community of Practice Focused on Student Learning for a visual representation of these relationships.

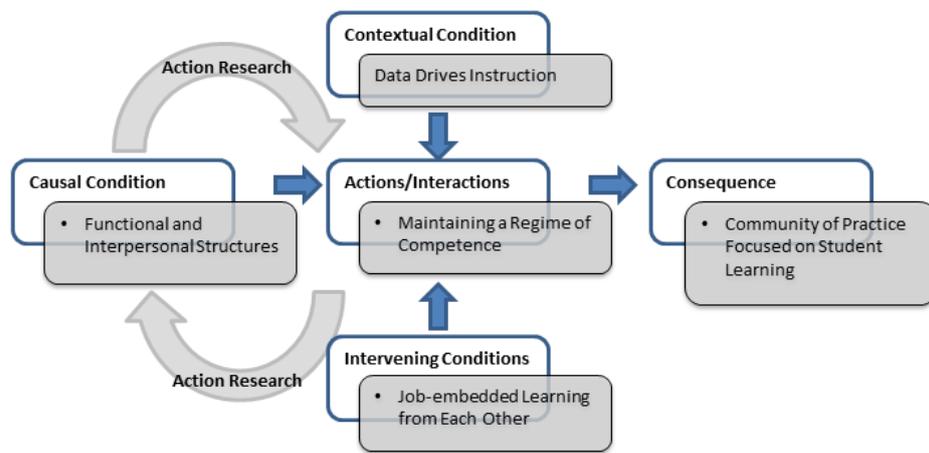


Figure 58: Phase 3 – PLC Community of Practice Focused on Student Learning

Once the PLC-specific community of practice is formed and is **focused on student learning**, it takes **functional and interpersonal structures**, the combination of *district policies, procedures, and practices* and *community principles*, to ensure the community of practice maintains its mutual engagement, shared repertoire, and joint enterprise **focused on student learning** going forward. This is what makes **functional and interpersonal structures** the causal condition for Phase 3. By Phase 3 the district has identified and made changes to *policies, procedures, and practices* that work in the district’s context to support the Professional Learning Community’s (PLC) structure. Additionally, the *community principles* developed in Phase 2 have created the interpersonal connections that support the PLC’s processes. When **functional and interpersonal structures** define the context and processes for mutual engagement, shared repertoire, and joint enterprise the PLC thrives.

The ongoing mutual engagement in a joint enterprise that maintains a shared repertoire means that maintaining a regime of competence represents the actions/interactions of the PLC in Phase 3. **Leadership**, as a function of the **community**, is demonstrated by maintaining the regime of competence. That is, sustaining a *coaching culture* whereby sharing knowledge is valued to maintain the PLC community of practice. Answering questions, meeting to discuss CFAs, meeting to plan strategy, and working on the pacing guides are some examples around which the PLC community of practice has negotiated the meaning of and defined competence for community membership. Maintaining a regime of competence actions/interactions are still based on answering the Four Critical Questions, but in this phase these reflective questions become part of the unconscious competence of the PLC community of practice; they are “just the way we work.” The meetings and conversations are now moving beyond grade band groups and starting to reach out to the groups above and below to ensure students have a smooth transition from grade to grade. When appropriate **functional and interpersonal structures** are a causal condition for a PLC, the PLC’s actions/interactions consist of maintaining a regime of competence as leadership that is a function of the PLC community of practice focused on student learning.

Action research cycles (via implicit plan, enact, and reflect processes) tie the causal conditions **functional and interpersonal structures** to the actions/interactions of maintaining a regime of competence by checking the new practice activities against existing **functional and interpersonal structures** to determine whether anything on either side of the equation needs to change. It is the sense of responsibility engendered in *community principles* that checks the standard of competence by asking “Is what we’re doing the best we can do?” If the answer is no, past experience has demonstrated that district policies, procedures, and practices can and will be changed to support the PLC work, if necessary. This demonstrates action research cycles working to maintain equilibrium between what was, what is, and what needs to be. When action research cycles maintain the equilibrium between the causal condition of **functional and interpersonal structures** and the actions/interactions of maintaining a regime of competence, the PLC community of practice is assured that its mutual engagement and shared repertoire are up to the joint enterprise of focusing on student learning.

The intervening condition for Phase 3 is job-embedded learning from each other. **Professional development** is no longer a causal condition or an

action/interaction; now **professional development** intervenes in the actions/interactions of maintaining a regime of competence. Learning with and from each other as part of how teachers' work means sharing expertise with each other, including subject matter coaches as peers in the process, and ensuring collaborative conversations are focused on student learning. Wenger (1998) indicates that when one considers practice (e.g., teacher practice) as a shared history of learning there are three factors that are tightly wound together and constantly at play:

1. Practice is not stable; it combines continuity and discontinuity.
2. Learning in practice involves mutual engagement, shared repertoire, and joint enterprise.
3. Practice is not an object; rather it's an emergent structure and is both open to agitation and resilient.

While the concepts of the practice being an emergent structure that combines continuity and discontinuity are most obvious in Phases 1 and 2, it is the concept about learning involving mutual engagement, shared repertoire, and joint enterprise that takes center stage in Phase 3. These concepts were introduced in Phase 2, but they embody job-embedded learning from each other in Phase 3. Mutual engagement now involves the whole scope of coaching and mentoring. Teachers openly and freely share their expertise. They see the value of including those with coaching roles in all conversations **focused on student learning**. The art and science of teaching has become a group effort. The Phase 3 shared repertoire is still influenced by the causal condition of **functional and interpersonal structures**, but the teachers are invested in each other to the point that **professional development** is teacher-led in both formal and informal situations. Joint enterprise provides the context for it all in that the learning is all connected to student performance as evaluated through CFAs. When job-embedded learning from each other is an intervening condition for the actions/interactions involved in *maintaining a regime of competence*, it is because learning in practice is tightly entwined with mutual engagement, shared repertoire, and joint enterprise.

The contextual condition of the actions/interactions of maintaining a regime of competence is **data** driving instruction. In Phase 3, **data** drives conversations that result in instructional plans. While the pacing guides determine the sequence in which standards are addressed, and, therefore, instruction, it is **data** that determines the success or failure of those strategies. When teachers and administrators choose to do something with the **data**,

student success increases. Formatively assessing creates powerful **data** that assists teachers and coaches in determining the best course of action for remediation and enrichment; thereby driving instruction. **Data**, gathered via the *Common formative assessment (CFA)*, provides rigor for decision making, because it is not anecdotal, it measures students equitably, and ensures those decisions are focused on student learning.

It is important to consider *Common formative assessment* as a whole and not break apart the concept into its constituent parts of 'common' and 'formative'; it is the combination of those parts that carries the power. Many schools use common assessments (e.g., provided for by Publishers or internal content writers), but they don't use them formatively. And many other schools assess formatively, but there may not be anything in common between the assessments or timing of the assessment within a grade or subject. The result of grade level or subject teachers in a PLC agreeing what to teach, when to assess, and how to assess, is the ability to collaboratively address all learning gaps identified in their students' assessment results. This reduces reliance on anecdote thereby allowing teachers to rely on facts as opposed to hunches. In Phase 3, *CFA data* also plays a large part in identifying teacher gaps in knowledge. By Phase 3, the aggregated school results are being shared across the district to inform decisions about teacher learning when gaps in student learning occur. Conversations held at the district level can plan interventions for teachers in much the same way that teachers plan for their students thereby providing objective measurement of competence in the practice. When **data** drives instruction is a contextual condition of the PLC community of practice, it ensures appropriate actions/interactions as the PLC community of practice maintains a regime of competence focused on student learning.

The consequence of the conditions and actions/interactions for Phase 3 is a functioning PLC community of practice **focused on student learning**. This new way of doing the practice of teaching (enactment) ensures successful student outcomes (meeting needs) while navigating the instability of the ever-changing reform environment through the ability to create knowledge as needed via the PLC community of practice learning in practice. When the **community of practice** is **focused on student learning**, the benefits are clear to participants and trust is front and center. Students are successful because their needs are met through the entire community collaborating in order to ensure the students are engaged in learning and have

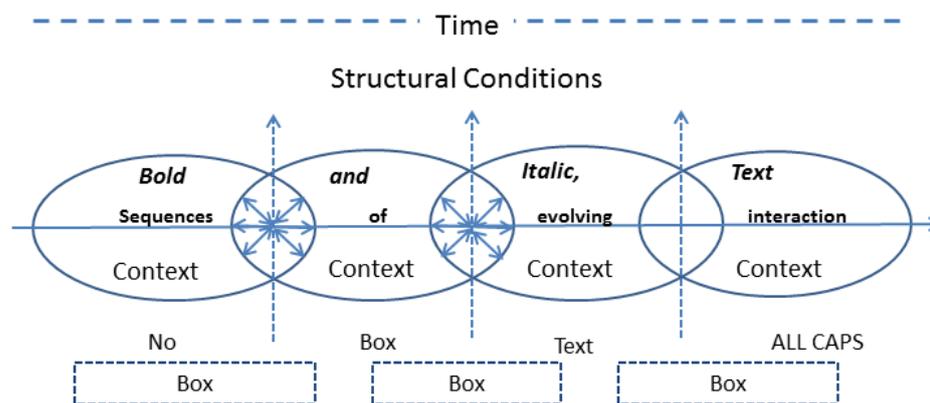
access to teachers. All of this is possible, because the PLC community of practice provides the common ground for creating knowledge through making sense of their context, goals, and challenges. In these ways, when a PLC community of practice focused on student learning is functioning properly, meeting student needs is the joint enterprise that creates the need for mutual engagement through enacting teaching methods and drives the shared repertoire of creating knowledge.

Now that **focus on student learning** is fully entrenched as *normalized practice*, and a **PLC community of practice** has formed to ensure significant and ongoing learning, Phase 3 provides the framework for a fully functional **PLC community of practice focused on student learning**. All components are in place to support ongoing action research cycles (via implicit plan, enact, and reflect processes) for both teachers and students. The causal condition for Phase 3 is the category of **functional and interpersonal structures**; it takes macro and micro **functional and interpersonal structure conditions** to maintain the forward motion. In Phase 3, distributed leadership actions/interactions of maintaining a regime of competence provide action research activities with plans, actions, and reflections for improvement. This allows for the reinforcement of the *coaching culture* whereby sharing knowledge is valued to sustain the community. These actions/interactions are impacted by the intervening condition of job-embedded learning from each other and the contextual condition of **data** driving instruction. Job-embedded learning from each other carries over from the creation of the PLC community of practice and the 'significant learning' that is embedded in the PLC community of practice construct. Since the PLC community of practice is focused on student learning, **data** drives instruction sets the context to ensure student learning and surface teacher learning. Therefore, when you have **functional and interpersonal structures** providing the causal conditions for maintaining a regime of competence actions/interactions that reinforce the *coaching culture* whereby sharing knowledge is valued to sustain the community with **data** driving instruction setting the context for the actions/interactions and job embedded learning from each other intervening to ensure consistency in the practice, the consequence is a community of practice focused on student learning.

5.3. Process and Structure Analysis

“Theory without process is missing a vital part of its story – how the action/interaction evolves. (Strauss & Corbin, 1998, p. 179)” Process, in a well-developed theory, derives from the researcher identifying patterns of actions/interactions that identify sequences of action. These sequences are dependent upon the structure or context within which they occur. This theory is a theory of process in that it consists of three, overlapping phases of action/interaction. While this is unusual, Strauss and Corbin (1998) are not opposed to it when it fits the data. Within each phase of this theory, there are also processes of action/interaction. It was this discovery that drove the theory into phases. That is, the theory became three distinct phases when the researcher realized that there were three, distinct sets of actions/interactions with associated structures within the key categories. This section will describe the processes and their structures that occur in each phase and that result in the phase’s consequence.

Strauss and Corbin (2008; 1998) introduce and use a diagram (Figure 59: Process within structure diagram) for parsing the structures involved in the process over time. It is similar to the Axial Coding Paradigm, in that it flows from left to right over time and identifies that inter/actions that happen within a specific context. This is how the processes and structures will be discussed in this section.



Strauss and Corbin Key

straight lines = evolving inter/action
circles = context for inter/action
overlaps in circles = intersection of conditions and consequences leading to change of variation in context and adjustments made in interaction to keep it flowing

McDonald Key

Context = Key Categories or Sub-Categories
Bold and italic text = phase actions/interactions
 Text below circles:
No box = sub-categories or properties of the Context or Action/Interaction that combine to result in new understanding that adjust the interaction to keep it flowing
Box = an example of a new understanding or interaction that changes the actions or interactions
All Caps = the sub-category of the consequence central category that is the final context for the phase

Figure 59: Process within structure diagram

5.3.1. Phase 1 Process and Structure

Phase 1 action/interactions involve creating and implementing policies, procedures, and practices that create the functional structures needed for the teachers to change their focus from teaching to student learning. While an individual teacher is able to change her focus from teaching to learning, in order for the district to change, there must be systemic adjustments that precede the change. Phase 1 actions/interactions are those systemic adjustments that create the ultimate structure within which the learning community functions. They are driven by the causal condition of “professional development to develop a PLC”. That is, when the district participates in professional development designed to develop a PLC, it comes to the conclusion that systemic adjustments are needed to be able to systematically focus on student learning. The diagram (Figure 60: Phase 1 Process and Structure) below demonstrates some of the Phase 1 cycles of action/interaction that lead from the causal condition to the consequence.

Phase 1: Systematic Response to Focusing on Student Learning

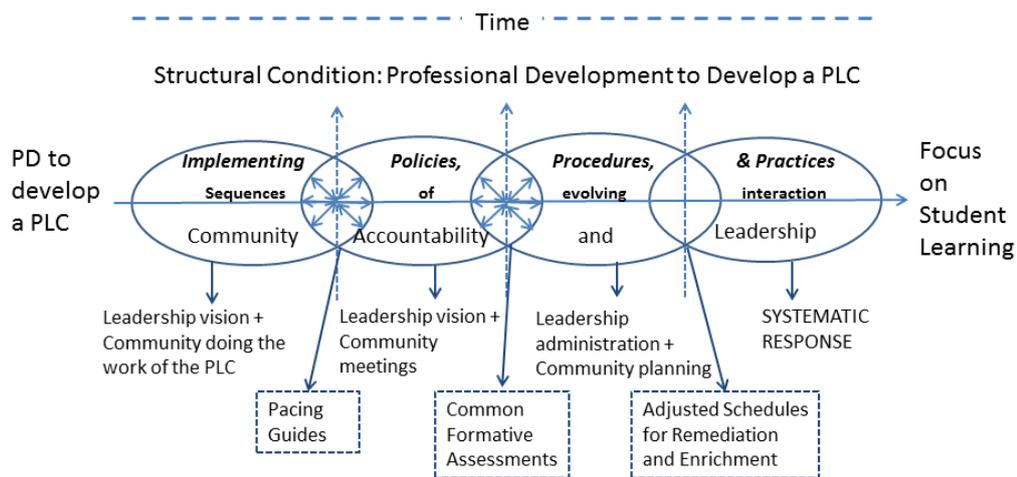


Figure 60: Phase 1 Process and Structure

Professional development to develop a PLC is designed to assist district employees in understanding the need for the change and the steps the district will take to make the change. The policies, procedures and practices are developed in the context of community accountability and supported by the vision of those in leadership initially found in the existing district leadership structure. The structures of community accountability and leadership vision allow the actions/interactions of implementing policies, procedures, and practices to happen. The community is accountable for participating in meetings and understanding their role in making the changes happen by doing the work of the PLC. This results in a district-wide vision that drives the rest of the activity. The district begins implementing policies about teacher core competencies, and procedures such as common pacing guides thereby creating new structures. These create the practices that start the community doing the work of the PLC. This leads to a new understanding about how to focus on student learning.

The new understanding allows the district to identify more procedures and practices to implement such as *common formative assessments*. Again, the community is accountable for this and leadership vision sets expectations for quality and use thereby providing specific structures within which to work. The community continues to do the work of the PLC and meets regularly to ensure the *common formative assessments* measure the paced content. These structures lead to pacing guides and *common formative assessments* that allow the PLC to answer the first two questions (1 What do students need

to learn? 2 How will we know whether they've learned it?). This leads the district to yet another, new understanding.

At this point, policies, procedures, and practices have accomplished three things: 1) defined what is to be taught; 2) paced the objectives so that teachers are teaching to the same objectives, in the same way, at the same time; and 3) formatively assessed the common instruction with a common assessment. The next step is to determine what to do about the results of the assessment. This drives the implementation of more policies, procedures, and practice that allow for remediation and enrichment. Once teachers are able to get a full view of their students' progress and ensure that all students are learning, they have another, new understanding. That is, they have developed a systematic way to focus on student learning. This new understanding then becomes the causal condition for Phase 2.

These are also cycles of participation and reification. The negotiation of meaning within the structures of leadership vision and community accountability creates the action/interaction of implementing policies, procedures, and practices, that result in reifications such as pacing guides, *common formative assessments*, and adjusted schedules that allow for remediation and enrichment. The causal condition of professional development to develop the PLC results in a systematic approach to focusing on student learning. Each PLC ends up with its own meaning about each of the reifications and these change as everyone participates in the practice of focusing on student learning.

5.3.2. Phase 2 Process and Structure

A systematic response to focusing on student learning was the outcome for Phase 1. Normalizing this change is now the causal condition that drives Phase 2. Phase 2 action/interactions involve *collaborative relationships* that build the PLC community of practice and function as professional development. The PLC community of practice forms, to normalize the change, as teachers work through the Four Critical Questions over and over and have the measurable structure of **data** around which to make decisions for learning. They are building *collaborative relationships* and those conversations create knowledge in the form of shared terminology and shared ideas. The diagram (Figure 61: Phase 2 Process and Structure) below

demonstrates some of the Phase 2 cycles of action/interaction that lead from the causal condition to the consequence.

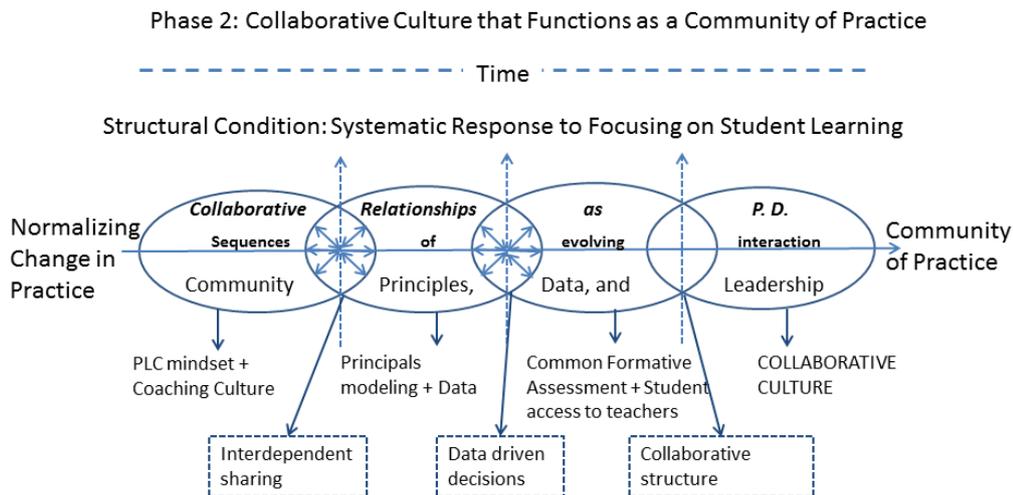


Figure 61: Phase 2 Process and Structure

Staying focused on student learning and normalizing that change is the causal condition for Phase 2. When the community has the structures of a PLC mindset (how do we work together to ensure our students learn) and a *coaching culture* (all the experts in the same room), they become interdependent and share what they know. This sort of sharing creates the *collaborative relationships* that convert conversation to knowledge. It provides the environment that helps teachers move from “me” to “we” – a new understanding of how to be a teacher.

Maintaining the understanding of how to be a teacher in this new environment depends on the structure of the intervening context of the principal modeling behaviors as a way to reinforce them and ensure teachers do not fall back into their old ways. Adding the contextual structure of **data** that represents a group of shared students, and being allowed to share the responsibility of ensuring they learn, opens doors to more learning for both teacher and student through the collaborative relationship actions/interactions. This combination of leadership and **data** creates a new understanding about decision-making that is based on **data**.

This new understanding about **data**-driven decisions allows teachers to focus their collaborative relationship actions/interactions on the results of the *common formative assessment* and creates a direct connection with meeting student needs by providing consistent access to teachers. The structure provided by the *CFA* process means collaborative relationship

actions/interactions function as professional development as teachers discuss how best to help their students. It is usually during these conversations that teachers identify gaps in their own knowledge. This keeps professional development focused on student learning, because the teachers are making sure they 'explicitly know' what they need to teach. It also creates a collaborative structure that encourages the collaborative relationship actions/interactions that lead to a collaborative culture and PLC community of practice . These new understandings are reified in the **functional and interpersonal structures** of the PLC community of practice and become the causal condition for Phase 3.

The cycles of participation and reification in Phase 2 are within the actions/interactions of the *collaborative relationships* (process). The process of *normalizing change in practice* to focusing on student learning leads to the actions/interactions of *collaborative relationships* supported by the structural conditions of *community principles*, **data**, and leadership. These structures and processes lead to the collaborative structure of a PLC community of practice . The collaborative relationship actions/interactions directly impact the identity of the community members as *community principles* are reified through negotiating what participation and non-participation entails. Teacher identities change from “me” to “we” and they see themselves as part of the whole solution. Collaborative relationship actions/interactions are teachers negotiating definitions of competence and contrasting those with experience that they reflect on together. “There is something unique that we can come to understand when our diverse perspectives converge in our attempts to align them for some purpose.(Etienne Wenger, 1998, p. 218)”

5.3.3. Phase 3 Process and Structure

Phase 3 action/interactions involve community leadership that maintains a regime of competence based on the **functional and interpersonal structures** that are in place. These lead to a PLC community of practice focused on student learning. The actions/interactions are based on the structures of **data**-driven instruction and job-embedded learning from each other. Instructional decisions are no longer made based on anecdotal evidence, and the people making the decisions share ownership of the processes to satisfy the tension between competence and experience. The diagram (Figure 62: Phase 3 Process and Structure) below demonstrates

some of the Phase 3 cycles of action/interaction that lead from the causal condition to the consequence.

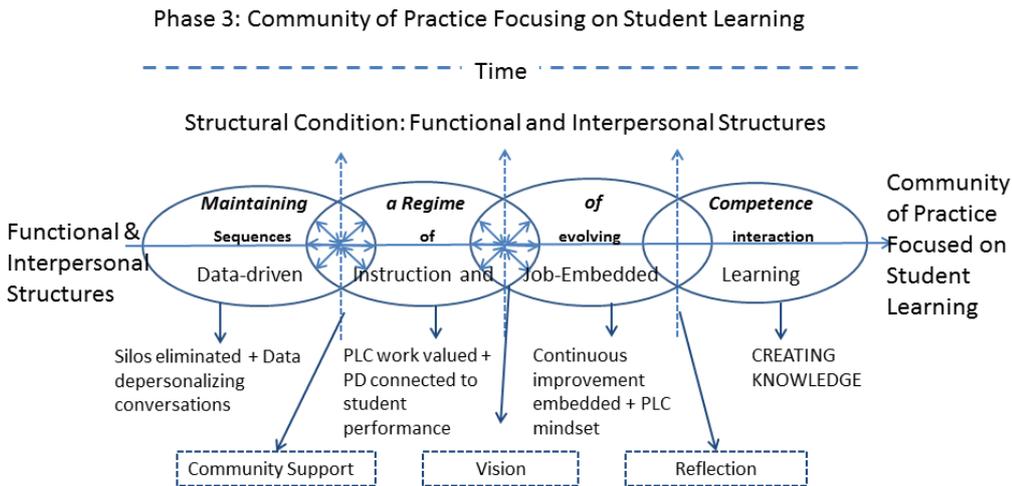


Figure 62: Phase 3 Process and Structure

The **functional and interpersonal structures** created in Phases 1 and 2 serve as the causal condition for Phase 3's actions/interactions. As the community moves into the third phase, teachers work within new structures that have eliminated silos of expertise and action. Conversations about teaching are based on the structure of **data** so that it is not a matter of opinion about who taught a concept better or what content should be taught. Teachers also include subject matter expertise in the conversations. This leads to the understanding that they work within a community and are both supporter and supported, thus maintaining a regime of competence.

By Phase 3, the structure of valuing PLC work is just the way teachers work. It is combined with the structure of connecting professional development to student learning. Answering the Four Critical Questions is the work of the PLC and the nature of the questions (i.e., they are focused on student learning) ensures that professional development (that is mostly achieved through *collaborative relationships*) is connected to student performance. By Phase 3, leadership is a function of the community (as opposed to being a specific role played by a privileged few). These structures work to maintain the regime of competence by balancing competence and experience in such a way that the community is able to communicate its own vision for what it can and will do. This new understanding leads the PLC community of practice into another round of competence vs. experience evaluation.

The new understanding that the PLC community of practice owns the vision for itself drives their ability to maintain a regime of competence in Phase 3. The structures at work now include having a PLC mindset that embeds continuous improvement. These concepts require teachers to constantly evaluate what is happening within the PLC community of practice and seek out discontinuities in structure and process. “In negotiating alignment across discontinuities, we can be forced to perceive our own positions in new ways, to have new questions, to see things we had never seen before, and to derive new criteria of competence that reflect the alignment of practices. (Etienne Wenger, 1998, p. 218)” The PLC mindset that embeds continuous improvement drives community-wide reflection that compares competence to experience and vice-versa thereby creating knowledge. The consequence is an informed PLC community of practice focused on student learning that is never satisfied with the way things have always been.

Participation in the PLC community of practice focused on student learning means that previously defined **functional and interpersonal structures** provide the basis for the actions/interactions of maintaining a regime of competence. Participation and reification in Phase 3 take the forms of supporting and being supported by the community, refining the vision, and reflection that leads to a state of continuous improvement. Structures of **data** driven instruction and job-embedded learning keep the PLC community of practice focused on student learning. According to Wenger (1998), a learning community is about social reconfiguration. Process and structures that support action/interaction provide a PLC community of practice focused on learning the opportunity to reflect on those processes and structures. This maintains the regime of competence in a healthy state.

5.4. Literature in Theoretical Development

As mentioned in Section 2.2, use of the literature in a grounded theory study is a contentious topic among researchers. Glaser (1998) indicates that it should only be used as more data while the theory is emerging. While Strauss and Corbin (1998) provide space for the researcher to reference the literature on a topic both as a way to provide context for the research as well as more data while the theory is emerging. Strauss and Corbin (1998, pp. 49–52) identify several ways to use the literature during analysis and theory development such as:

- Identifying questions and areas of interest for theoretical sampling
- Identifying whether or not emerging concepts are related to existing concepts as well as how they are different or the same
- Identifying points of convergence and divergence between the new and existing theories.

The theory that emerged as a result of this study used the literature during theory development as Strauss and Corbin (1998) recommended and, specifically the first two uses (questions and context) identified above. The third use (points of convergence and divergence) is detailed in Chapter 6. This section will cover the use of the literature during theoretical development.

5.4.1. Areas of Interest for Theoretical Sampling

As mentioned above, one of the uses of literature that Strauss and Corbin (1998) identify is to assist the researcher during theoretical sampling by raising areas of interest and questions to be answered by the sampling. Their reasoning is that the literature might shed some light on what the researcher is studying that would illuminate relationships between concepts and prompt questions to be answered. It was this researcher's familiarity with the literature on Communities of Practice that allowed her to be sensitive to the similarities and differences between communities of practice and professional learning communities. It was this sensitivity that prompted the inquiries into the ways the community functioned. For example, during the first round of theoretical sampling (Section 3.6.7.2), there was a hypothesis regarding formal and informal learning. These concepts are discussed in knowledge management theory that incorporates communities of practice theory (Kimble & Bourdon, 2008; Meijs et al., 2016; W. R. Penuel et al., 2010; Thacker, 2017), and understanding participants' perception of the impact of these two types of learning helped the researcher tease out the three phases. The participants were clear that much of the formal learning they encountered was centered on learning how to create the PLC or was driven by teacher-identified needs.

We did a lot of workshops for the PLC through Solution Tree, which was a big part of our PD.

...every month we talk about with the Math Teacher Leaders -- where are we? what are the needs that are out there? And then we will plan an activity, a training, etc. based on that.

Whereas, they considered the conversations they had around the Four Critical Questions an excellent (informal) learning experience as well.

I will say some of our best conversations and best professional learning meetings, sometimes it's not just about the data. When someone says, 'What are you doing with this unit?' Or, 'How are you teaching this?' Sometimes it's just that casual conversation that allows us to share. We do use the data to discuss, 'What are you doing? How did you get those results? How are the students learning? What can we do better?' We review every week. But sometimes, for us personally, it's the best conversations when it's just casual and we ask, 'How are you teaching this?'

Additionally, communities of practice theory provided the theoretical sensitivity to ask about the importance of specific conversations during the theoretical sampling for Selective Coding (See Table 19: Theoretical Sampling Analysis). Conversations are sometimes a negotiation of meaning, therefore the researcher wanted to understand which conversations consisted of negotiation of meaning.

You know talking about pacing guides like what standards. You know, breaking the standards down to nine-week periods. Why would you put this standard with this? And why would you pair it with that? You know, going back to, 'Well, we've always taught poetry in the spring.' Why? Wouldn't it make sense to do that when you're teaching figurative language?

5.4.2. Relationship of Emerging Concepts to Existing Concepts

Another way Strauss and Corbin indicate the existing literature can aid theory development is through the comparison of emerging concepts to existing concepts. How are they similar or different, and how does this impact the emerging theory? Existing literature played a role in the development of the theory in this chapter at three points and in three ways. The first two occurred during analysis and data gathering and helped drive the inclusion, exclusion, and early relationships between concepts. The third occurred while

writing the theory as a way explain and expand on the concepts and their relationships within the various phases.

The first example of referring to the literature in order to identify the relationship of emerging concepts to existing concepts occurred during analysis. At the point where the researcher identified the early categories and relationships she read DuFour, Eaker, and Many's (2006) book, "Learning by Doing." Since the PLCs in this study were developed using DuFour, Eaker, and Many's training and concepts, reading their book helped the researcher understand the context for many of the terms that the study participants used. It was the use of this material as 'more data (Barney G. Glaser, 1998)' that helped the researcher come to the conclusion documented in Section 3.6.7.3.1 Initial Struggles.

The second example occurred when the researcher reviewed Senge's (2006) seminal work, "The Fifth Discipline." Since the literature on PLCs is frequently driven by learning organization theory (Richard DuFour et al., 2006; Hord, 1998; Stoll et al., 2006), and since the researcher had studied Senge as part of her Masters (and had an early version of his book), she was aware of the concept of a Learning Organization. This was about the same time she read "Learning by Doing" and was struggling with the difference between the concepts emerging from her data and existing literature concepts. Reviewing Senge reminded the researcher that his work was quite theoretical and spoke primarily of the benefits of thinking of businesses as organizations that must continually learn as opposed to providing a road map to achieving that state. The emerging theory was helping to define a process and key elements of that process that were based on organizational learning concepts.

The third example of comparing existing concepts to emerging concepts occurred as the theory developed. At this point the researcher consulted community of practice literature (primarily Wenger's (1998) book, "Communities of Practice: Learning, Meaning, and Identity"), to clarify whether or not some of the emerging concepts and their relationships were similar to or different from community of practice theory concepts and relationships. At this stage, specific communities of practice theory concepts (such as joint enterprise, mutual engagement, shared repertoire, and negotiation of meaning) were used to help describe the emerging theory through its concepts and their relationships to each other. This served to further develop the theoretical understanding of the phenomenon of the study (Torraco, 2002)

as well as provide a way to explain and expand on the concepts and their relationships within the various phases.

5.4.3. Summary

As Lo (2016, p. 177) states, “Literature review is fluid and additive in nature in grounded theory (GT).” Literature, in grounded theory, provides both sensitivity and data as the theory emerges. This section has demonstrated those aspects of literature in the grounded theory methods used.

5.5. Theory Building

Since this study sought to create a theory of change in teacher practice with explanatory and predictive power and this chapter presented that theory, this section of the chapter will reflect on what theory is and why and how one builds it in order to demonstrate that what has been presented is theory.

5.5.1. What is theory?

There is not a consistent definition of what a theory is (Corley & Gioia, 2011; Lynham, 2002), but scholars in the education and social sciences fields generally subscribe to the definition that “theory is a statement of concepts and their interrelationships that shows how and/or why a phenomenon occurs.(Corley & Gioia, 2011)” Strauss and Corbin (1998, p. 15) indicate that theory is “a set of well-developed concepts related through statements of relationship, which together constitute an integrated framework that can be used to explain or predict phenomena.” The key pieces of theory are the delineation of concepts and their relationships to each other in order to explain or predict a phenomenon.

5.5.2. Why build theory?

Theory is frequently seen as something academics deal in but that is not practical for application (Corley & Gioia, 2011; Lynham, 2002; Strauss & Corbin, 1998). In their treatise on what constitutes theory contribution, Corley and Gioia (2011) identify two concepts by which to define theory contribution. Each of those concepts has two properties. They indicate that good theory

contributions should be determined by originality and usefulness (see Figure 63: Current dimensions for theoretical contribution). That is, originality can come in incremental adjustments to existing theory or revelatory theory that “reveals what we otherwise had not seen, known, or conceived. (Corley & Gioia, 2011, p. 17)” Additionally, utility is broken into two categories: practically useful and scientifically useful. Practical usefulness is theory that can be directly and immediately applied in the discipline’s practice setting. Scientific usefulness is theory that adds rigor to the body of knowledge within the discipline. The numbers in the figure, indicate the order of importance some publishers place on the various pairings.

	Revelatory	4	1
Originality	Incremental	3	2
		Practically useful	Scientifically useful
		Utility	

Figure 63: Current dimensions for theoretical contribution (Corley & Gioia, 2011)

The authors use these distinctions to discuss the need to create theory that is both original and useful, but they take the conversation a step further. They recommend that researchers should possess theoretical prescience and that this involves “the process of discerning what we need to know and influencing the intellectual framing of what we need to know to enlighten both academic and reflective practitioner domains.” These are important aspects to consider as one prepares a study and then publishes findings in journals.

5.5.3. How to build theory?

Lynham (2002) indicates that all research to build theory undergoes five, generic stages. She suggests that if one understands where research questions and methodology fit within these five stages, one is able to discuss research results in a way that demonstrates originality and utility. The five stages are:

- Conceptual development

- Operationalization
- Application
- Confirmation or disconfirmation
- Continuous refinement

Lynham notes that it is not necessary to think of this as an order that must be adhered to, but that a theory will go through each phase at some point.

Where the theory begins is largely dependent upon the research methodology. To understand the relationship of the theory, methodology and stage, one must understand Lynham's purpose for each stage.

The conceptual development phase requires the theorist to develop an informed conceptual framework that provides understanding about the phenomenon under study. This would include explanations of the nature and underlying forces of the issues.

The operationalization phase of the theory building process means the theorist is making connections between the concepts developed and real-world practice. That is, the conceptual framework must be applied to and empirically confirmed in the world in which the phenomenon occurs. These phases relate to the scientifically useful aspect of Corley and Gioia's (2011) contribution theory as they ensure rigor in the discipline.

The application phase is literally the practical application of the theory in the environment from which the phenomenon was identified. It is this phase of the theory building that ensures that practice has the opportunity to judge the theoretical frameworks utility. The theorist should use this phase of the process to further inform and develop the theory.

The confirmation or disconfirmation phase is the application of the scientific process to plan, design, implement, and evaluate aspects of the theoretical framework. It is through this process that practitioners may become confident that tested aspects of the framework are useful in informing practice. These two phases address the practically useful aspect of Corley and Gioia's (2011) contribution theory.

The last phase, ongoing refinement and development, is necessary because a theory is never complete (Cohen, 1980; Locke, 2007; Lynham, 2002). This phase ensures both scientific and practical usefulness by keeping the theory relevant and useful.

5.5.4. How does this apply?

The theory presented in this chapter is the result of a grounded theory approach to theory discovery. The theory is presented as well-developed concepts that address both the process and structure of the phenomenon and demonstrates how and why it occurs.

Grounded theory is best suited to allowing new insights to emerge. This theory meets the criteria of being scientifically useful and incrementally original, because while it reinforces that learning does occur in PLCs, it goes beyond this. Accordingly, this theory is scientifically useful and revelatory original, because it provides a theoretical framework for why and how teacher learning occurs. The theory is also practically useful and revelatory original, because it provides a new lens through which PLC practitioners are able to think about what they are doing.

Because this research started with practice that led to research, it meets the criteria to address the first two phases of Lynham's (2002) theory building process: concept development and operationalizing. It meets the criteria for concept development in that it provides new insight into how PLCs create learning. That insight emerged from the data and the researcher's theoretical sensitivity. Since the study sought to understand how teacher change in practice is created and sustained in PLC's, the data represent the practice of the PLC.

It meets Lynham's criteria for operationalizing, because part of the grounded theory process is to validate the theory through member-checking. That is, the study participants are in the world from which the theory emerged, and they reviewed the theory to provide feedback that informed adjustments to the theory. Since the theory discusses the practice in the framework of process and structure, members were able to comment on the full experience of participating in a PLC as discussed in the theory.

5.6. Conclusion

This chapter includes the last stages of the process for data becoming theory, the theory that emerged, the confirmation that the theory is a three-phase process, and a discussion of what theory is, why we build it, and how we build it.

Chapter 6: Comparison to the Literature and Discussion

The purpose of this chapter is a comparison of the theory presented in Chapter 5 with key, current literature topics. Grounded theory literature does not discuss literature comparison in any depth. However, Strauss and Corbin (1998) suggest that it is a way to confirm the researcher's findings as well as identify inconsistencies or gaps in the existing literature. Lo (2016) suggests that there is a continuum of literature use within a grounded theory research project. He states that at this point in the research process, "a recursive review of literature with an aim to cross-validate the emerged theory can further benefit the soundness of a GT study by rendering a higher degree of abstractness and meaningfulness to readers.(Lo, 2016, p. 183)" Therefore, this chapter will address:

- A summary of the theory presented in Chapter 5. The summary highlights aspects of the emerged theory that will be compared to the current literature.
- Similarities and differences between the PLC literature and this theory as a means of cross-validating the emerged theory and providing theoretical contexts for the process and structure statements made in the theory (as mentioned in 5.4 Literature in Theoretical Development).
- PLCs as learning organizations and PLCs as a specific type of community of practice. This includes key elements of the emerged theory (and their context within PLC and CoP literature) that begin to explain how the PLC forms through:
 - changing teacher practice
 - this change creating a specific type of community of practice
- The conditions and contexts that create PLCs that function as a specific type of community of practice.

6.1. Summary of the Theory

The main contribution of this research study is a substantive, mid-range theory that explains how effective PLCs form and create teacher change in practice that improves student performance. The theory presented

in this thesis describes the development and ongoing work of a PLC using six key categories, and their relationships to each other, as the PLC progresses through three phases of change. The theory also fuses the concepts of Professional Learning Community and Community of Practice such that it describes the PLC as a specific type of community of practice.

As a reminder, this theory identified six key categories that play different roles in three phases of developing and sustaining a PLC. The key elements that emerged from the data in this study are:

- Leadership
- Functional and Interpersonal Structures
- Community
- Focus on Student Learning
- Data
- Professional Development

The three phases culminated in:

1. A Systematic Response to Focusing on Student Learning
2. A Collaborative Culture that Functions as a Specific Type of Community of Practice
3. A Community of Practice Focused on Student Learning

6.2. Comparison and Contrast

As stated in Section 2.3.12 Current themes in PLC Research, there are three major themes in the current literature about PLCs:

1. **Hord's Five Critical Attributes and Fullan's Three Phases of Change** – Shirley Hord (1997) identified five critical attributes of a successful PLC (supportive and shared leadership, collective learning and application, shared values and vision, supportive conditions, and shared personal practice). These have provided a great deal of the focus of existing research (Hipp et al., 2008; Huffman, 2011). Huffman's (2011) longitudinal research project paired Hord's five critical attributes with Fullan's (1985) three phases of change.
2. **Leadership** – Studies in this line of research focus on leadership of the change process, the role of principals, how to

diffuse leadership among teachers, and the impacts of district leadership on the success or failure of PLCs in schools.

3. **Conditions/contexts for creating and sustaining** – Recent literature reviews of PLC research identify the need to understand the conditions/contexts of creating PLCs and sustaining continuous improvement in a learning organization (Hairon et al., 2013; Jones & Thessin, 2015).

This section will compare and contrast the similarities and differences between this theory and the literature with regard to the first two themes: 1) Five Critical Attributes and Three Phases of Change; 2) Leadership. Ways in which this theory address conditions and context for creating and sustaining continuous improvement will be addressed in 6.4 Conditions and Context Discussion.

6.2.1. Five Critical Attributes and Three Phases of Change

As mentioned above, Hord's theory of effective PLCs contains five critical attributes that are present in successful PLCs. These attributes with their properties, as summarized by Huffman (2011), are similar to the six key categories and sub-categories presented in this theory. In addition, Huffman, in her longitudinal study, utilized Fullan's three phases of change to locate the five critical attributes in the development of effective PLCs. The theory presented in Chapter 5 has a similar structure. Therefore, these concepts are the basis of this comparison and contrast.

Shirley Hord (1997) identified five critical attributes of effective PLCs:

- Shared and supportive leadership
- Collective learning and application
- Shared values and vision
- Shared personal practice
- Supportive conditions
 - Structures
 - Relationships

Michael Fullan (1985) identified three phases of change:

- Initiation
- Implementation

- Institutionalization

These will be compared and contrasted with similar aspects of this theory as summarized in Section **Error! Reference source not found.**

6.2.1.1. Hord’s Critical Attributes Comparison

All but one of the key categories of the theory presented in this thesis is aligned with the five critical attributes of effective PLCs Hord identified (see Table 30: Concept mapping between theories).

Table 30: Concept mapping between theories

Categories From This Theory	Hord’s Five Attributes
Leadership	Shared and supportive leadership
Functional and Interpersonal Structures	Supportive Conditions: Structures and Relationships
Community (of Practice)	Shared personal practice
Focus on Student Learning	Shared values and vision
Professional Development	Collective learning and application
Data	N/A

The concept of leadership in this theory aligns with the concept of shared and supportive leadership in Hord’s elements (Hord & Tobia, 2012).

Hord indicates that shared and supportive leadership includes:

- Nurturing leadership among staff
- Shared power, authority, and responsibility
- Broad-based decision-making that reflects commitment and accountability
- Sharing information (Huffman, 2011, p. 324)

In this theory, the category of leadership represents the ability to act as a change agent by creating a vision of the future that focuses on student learning. Leadership also represents the ability to support and mentor staff into that vision so everyone is able to stay-the-course. Leadership is present at multiple levels of the district structures—from the Board of Education to the Superintendent of Schools to central office staff, principals, and teachers. Leadership is a function of the community as opposed to a role played by a specific person or group.

Both concepts of leadership demonstrate that, ultimately, leadership is a key element to successfully develop and sustain PLCs. This leadership is in both information and behavior modeling. However, the theory presented in this thesis provides leadership tasks that combine leadership styles

(instructional, distributed, or transformational) in each phase to sustain the PLC. Hord's concept of leadership (as seen in the elements of leadership) is primarily a distributed leadership. The concept of leadership presented in this theory demonstrates transformational leadership is needed as the district begins to change teacher practice. This theory demonstrates instructional leadership being somewhat transitional as the teacher's begin to take responsibility for helping each other become knowledgeable in their new practice. This theory demonstrates distributed leadership as the community solidifies and district managers becomes part of the community leadership.

Hord's second critical attribute, supportive conditions (structures and relationships), aligns with the key category of Functional and Interpersonal Structures within this theory. Hord's supportive condition of structures compares to the sub-category of policies, procedures, and practices in this thesis in that it identifies the need for structures such as facilities, resources, and communications systems (Hord & Tobia, 2012). These are somewhat more specific than policies, procedures, and practice, but policies, procedures, and practices are the rules, contracts, and requirements of any district, but in this case, they are designed to support forming and sustaining the professional learning community. That is, while this theory agrees that creating support facilities, resources and communications systems is needed, this theory also provides guidance about how these structures impact community of practice formation as well as the benefits that result when each supportive structure is established.

According to Huffman (2011, p. 324), Hord's critical attribute of relationships as supportive structures includes:

- Caring relationships
- Trust and respect
- Recognition and celebration
- Risk-taking
- Unified effort to embed change

The sub-category of community principles in this theory addresses specific dimensions of building the supportive relationships Hord describes. Community principles represent the interpersonal rules, contracts and requirements between the community members. These take the form of caring relationships, trust and respect, and a unified effort to embed change that Hord describes.

This theory does not specifically address recognition and celebration or risk-taking. However, these activities were certainly evident in the data. In this theory the relationship building, caring, and support must culminate in negotiated joint enterprise and shared repertoire through mutual engagement. Together, the sub-categories of policies, procedures, and practices and community principles set the context for community interaction.

It is interesting that Hord also sees that these two properties of supportive conditions belong together. In this theory, policies, procedures, and practices address the same aspects of building and sustaining a PLC as Hord's supportive structures. Community principles address the same aspects of building and sustaining a PLC as Hord's supportive relationships. For Hord, these are combined under the key category of support whereas they are sub-categories of the key category of functional and interpersonal structures in this theory. Functional and interpersonal structures are a function of the community. Another way to think of this is that functional and interpersonal structures create the overall system of governance within the community.

Hord's third critical attribute, shared personal practice, includes these dimensions:

- Peer observations to offer knowledge, skills, and encouragement
- Feedback to improve instructional practices
- Sharing outcomes of instructional practices
- Coaching and mentoring (Huffman, 2011, p. 324)

Kruse and Louis (1995) refer to this as de-privatization of practice. This concept does not map to the concept of community that is presented in the theory described in Chapter 5. However, the activities Hord identifies as 'shared personal practice' are critical to achieving the outcome of Phase 2 – a collaborative culture that functions as a community of practice – in this theory.

The four dimensions listed above are all aspects of the community of practice formed when teachers negotiate the meaning of the Four Critical Questions. In order to answer the questions, teachers discuss instructional practices, receive and provide coaching and mentoring, observe and discuss other teacher's methods, and discuss the results of the CFAs and how best to address student needs.

Functioning as a community of practice seems to be a critical piece of the overall change process. It is possible that without a community of practice, hoarding knowledge still provides power and prestige, community members remain in their classroom silos, and PLC activity is seen as separate from day-to-day functioning thereby limiting learning within the community. However, the consequence of Phase 2 conditions and actions/interactions is the creation of a community of practice where sharing knowledge provides power and prestige, community members collaborate with teachers in other classrooms, and PLC activity is “just how we work.”

The theory presented in Chapter 5 discusses Hord’s ‘shared personal practice’ activities as the actions/interactions of collaborative relationships. The discussion in Section 5.2.3 pairs the concepts of the actions/interactions working to develop and implement community principles of how to interact in such ways. It also adds the context of the data from common formative assessments as an intervening condition to the actions/interactions of the collaborative behavior. That is, data informs the conversations that result in the collaborative behaviors. Overall, this provides a more contextual reason for doing any of the activities that Hord identifies.

The fourth critical attribute, shared values and vision, according to Hord, include:

- Espoused values and norms
- Focus on student learning
- High expectations
- Shared vision guides teaching and learning (Huffman, 2011, p. 324)

This critical attribute from Hord aligns with the key category of Focus on Student Learning presented in this theory. While Hord presents ‘focus on student learning’ as a property of shared values and vision, the theory presented herein identifies focus on student learning as the motivation for the shared vision and values to the point that it is the outcome of Phase 1.

Hord states:

“A fundamental characteristic of the vision in communities of professional learners is an unwavering focus on student learning. There is little question that individual teachers at Cottonwood have a selfless attitude about serving kids. Their vision for the school

and for themselves is a vision that focuses on children and children's success.(Hord, 1998, p. 5)"

However, the data in this study demonstrated for this researcher that the source of all the changes is the change to focusing on student learning. One participant stated this in an interview:

So when you focus on learning instead of teaching, where at the beginning of that time that you are instructing and the targeted instruction are fixed and learning is a variable. So with the focus on learning that switches. Learning is fixed and the time with which you teach something and how you do it is the variable instead. That was a big cultural shift for our building when we started this.

Without the change in focus to guide the community, it is more difficult to agree on norms and values, it is easier to set high expectations for actions that do not benefit students, and it becomes difficult to agree on a clear mission and vision. This need to actually have focusing on student learning as the driver for changing teacher practice is reinforced by several studies that investigate such things: 1) the term PLC being coopted to mean 'teacher learning' (Watson, 2014); 2) the importance of the focus of meetings (Popp & Goldman, 2016); 3) the mixed results when PLCs are formed "to engage in reflexive conversations regarding the incorporation of a socially just orientation in their classroom pedagogies. (Fataar & Feldman, 2016, p. 99)"

The last, critical attribute is Hord's concept of collective learning and application. Huffman (2011, p. 324) has identified the following properties as part of this concept:

- Sharing information
- Seeking new knowledge, skills, and strategies
- Working collaboratively to plan, solve problems, and improve learning opportunities

This critical attribute aligns with the key category of professional development in this theory that represents the learning journey teachers travel as they change from being a district of individual teachers to a community of practice focused on student learning. Within the PLC, professional development is both a change catalyst and a change support. Professional development, in this

theory, encompasses all the properties of Hord's collective learning and application.

All three phases of this theory demonstrate teachers sharing information, seeking new knowledge, skills, and strategies, and working collaboratively to plan and solve problems that improve learning opportunities. In Phase 1 this is done explicitly to develop the PLC. At some point during Phase 2, the specific type of community of practice forms and these activities become part of the mutual engagement in joint enterprise that creates shared repertoire and drives teacher learning that carries through to Phase 3.

This theory included the concept of data as a key category of a successful PLC that was not part of Hord's critical attributes. Richard DuFour (2015, p. 23) asked and answered this question:

The defining characteristic of a successful professional learning community? It uses data to improve student learning.

This theory demonstrates that data represents measurement and provides objective evaluation of success and failure of student and teacher. The community knows whether it is successful with its focus on student learning based on data, because data answers the question, 'Have the students learned what we've set out to teach?'

Data, when gathered and used appropriately, impacts classroom instruction (Richard DuFour, 2015; Michaud, 2016; Schildkamp et al., 2016; *Obviously, That Worked.*, 2016) as well as teacher learning (Richard DuFour, 2015; Penner-Williams et al., 2017; Popp & Goldman, 2016). In this theory, the data available from the Common formative assessment (CFA) informed decisions about remediation and enrichment as well as about how the teachers would do things the following year. As stated previously in this paper, the mutual engagement and shared repertoire that develop as teachers go through the data analysis process generates new knowledge among the teachers.

While member-checking the theory, one of the respondents (who consults on PLC development) had a passionate response to how data gathering and use fit into the theory. She wanted to make sure that it was clear that the conversations about data were the most powerful aspect of the PLC process; they generated learning for both teachers and students.

Aspects of Hord's Five Critical Attributes of a successful PLC are present in the theory presented in Chapter 5 of this thesis (see Table 30: Concept mapping between theories). The theory presented in Chapter 5 assists in understanding the causal conditions that drive these elements and their activities. This theory also provides explanations of the context and outcomes of their use.

6.2.1.2. Three Phases Comparison

Many researchers involved with educational change in general, and PLC changes in particular, have identified the need to think about change in terms of phases as does the theory presented in Chapter 5. Michael Fullan's (1985, 1994, 2005) work on educational change includes three phases of change: initiation, implementation, and institutionalization. Three stages of a PLC are also mentioned in Bolam, McMahon, Stoll, Thomas, Wallace, Greenwood, Hawkey, Ingram, Atkinson, and Smith's (2005) review of creating and sustaining PLCs: starter, developer and mature. The authors state these phases "provide some useful insights into these changes and ways of responding to them but needs modifying to be of real help for practitioners and researchers."

Fullan's, as well as Bolam, et. al.,'s, three phases are generalizations of what is happening within a generic change process. That is, there is little specificity in their phases that applies directly to creating and sustaining PLCs. Fullan and Bolam et. al.,'s approach to change seems to be something leadership implements, and everyone else 'buys into.' By contrast PLC activities are designed to be inclusive of or driven by teachers. The theory presented in this thesis suggests that change is emergent and includes the teachers as part of the transformation.

Additionally, the phases discussed in this theory identify potential causal and contextual conditions that may result in a specific outcome for a phase. Within the PLC context, while district leaders initiate the change process, their whole goal is to include teachers in planning and implementing changes so that teachers are part of the transformation and leadership is distributed among the teachers and into the function of the community as soon as possible (see more in Section 6.2.1.3). This provides a more nuanced approach to leadership's role in creating change. The differences in approach

are likely the result of Fullan's concepts having a broader application than the concepts discussed in this theory.

Fullan's (1985) initiation phase includes mobilization, adoption decisions, and development. It depends on a great deal of planning and decision-making before teachers are involved. When teachers are involved, they are to implement changes someone else told them to implement. The theory in this thesis explains that teachers are involved from the beginning (Phase 1) as professional development about PLCs is provided before any change decisions are made. Teachers are included in identifying the reasons for the change and determining how they will change through mission and vision statement development.

Fullan's implementation phase focuses on "putting the change into practice.(Fullan, 1985, pp. 404–405)" Earlier in the article, Fullan echoed Guskey's research that "changes in attitudes, beliefs, and understanding tend to follow rather than precede changes in behavior. (M. Fullan, 1985, p. 393)" Yet, when discussing the phases of the change process, Fullan implies that change in practice (implementation) happens as a result of a change in attitudes, beliefs, and understanding (i.e., following initiation efforts). The theory discussed in this thesis describes how the change in practice (behavior) is the catalyst for the change in knowledge. The second phase in this theory is only possible when preceded by the changes that teachers make in their behaviors in the first phase. That is, until teachers have begun implementing the systematic activities to focus on student learning, they are not able to create a collaborative culture that functions as a community of practice.

Fullan's institutionalization phase is where he envisions innovation happening. That is, it is not until the third phase that the district will really see the value of the first two phases of change. Fullan's concept of institutionalization does not fully encompass the ongoing innovation that a PLC generates. In this theory, each of the three phases produces innovation. Phases one and two of this theory culminate in innovations – a systematic response to focusing on student learning and a collaborative culture that functions as a community of practice. Phase three of this theory is, as Huffman (2011) puts it, about sustaining the innovations that have occurred while simultaneously seeking out new innovations.

This analysis chose only one aspect of Fullan's extensive writing on school change, because this concept applied most directly to the theory described in Chapter 5. Much of Fullan's writing is useful in understanding drivers that leaders must consider when implementing change (Fullan, 1985, 2005, 2009). Many of the ideas Fullan puts forward overlap with concepts within this theory and other writings about implementing change. Fullan's research and recommendations about change are written to provide guidance when implementing any educational change while this theory is primarily focused on change in teacher practice through the implementation of a PLC that creates a specific type of community of practice.

6.2.1.3. Leadership

At least three styles of school leadership are discussed in the current literature: Transformational Leadership, Distributed Leadership, and Instructional Leadership (Fullan, 2005; Hord, 1997; McDonald & Savage, 2016; J. Murphy et al., 2009; Vanblaere & Devos, 2016; Wahlstrom et al., 2010; Wang, 2016). Transformational and distributed leadership are management oriented types of leadership that encompass concepts about where and how leadership functions within a system. Instructional leadership is considered to be leadership in subject matter expertise. The current literature discusses leadership with regard to specific, existing roles within a school or district. As identified in Section 6.2.1.1, leadership is considered a key attribute in Hord's (1997) five key attributes of a successful PLC. She discusses leadership in terms of being shared and supportive. The theory presented herein has identified the presence of all three types of leadership in PLCs and that it should be shared and supportive. However, other than in Phase 1, leadership is not the function of an existing role; rather it is a function of the specific type of community of practice.

When transformational leadership is most often discussed, it is used to describe a management style for those with traditional leadership positions within the district or school (Berkovich & Eyal, 2017; Hallinger, 2003; McCarley et al., 2016). For example, those with formal management positions like Superintendents, Directors, and Principals. It is nearly always discussed in a general way. That is, to transform a district or school from one thing to another, but the purpose or goal of the transformation is rarely the same.

In this theory, transformational leadership plays a specific role in Phase 1 as the district moves from its existing format and focus to the PLC format wherein student learning is the focus. Existing school and district leaders (e.g., Superintendents, Central Office staff, and Principals) take the lead in transforming the district from teaching to learning and from individual teachers to a community of practice of teachers.

In Phases 2 and 3 of this theory, transformational leadership becomes part of the continuous improvement process and, therefore, not the function of a particular role; it is a function of the specific type of community of practice. In Phases 2 and 3, the whole community owns their practice and continuously evaluates its participation and reification activities. It is up to the community to identify aspects that need transformation and then determine a path to accomplish the transformation.

Distributed leadership is most often discussed in terms of Principals encouraging teachers to take on leadership roles (Hairon et al., 2013; Louis et al., 2013; J. Murphy et al., 2009; Nappi, 2014). That is, as the literature begins to converge on the importance of collaboration among teachers, it is also recommending that teachers help to lead each other to better practices (Richard DuFour et al., 2006; Duignan & Cannon, 2011).

In this theory, leadership begins to be distributed in Phase 1 as teachers start rearranging their days and answering the Four Critical Questions. It is during Phase 1, that Central Office Staff and Principals are modeling the leadership behavior they expect from teachers in an effort to transform the district by distributing leadership across the community. However, distributed leadership becomes more evident as the PLC moves through Phase 2.

Leadership becomes fully distributed by the time the specific type of community of practice is formed at the end of Phase 2. As with transformational leadership, the continuous improvement process that is in place by the end of Phase 2 distributes leadership across the community members. In a fully-functioning community of practice, distributed and distributing leadership is a function of the community and not a person or a role.

Instructional leadership is most often attributed to the duties of principals of schools (Drysdale & Gurr, 2011; Hallinger, 2003; Honig, 2012;

Terosky, 2016). That is, along with the principal's managerial duties, s/he must also be a subject matter expert who is able to coach and lead teachers in their instructional practices. Hallinger (2003) points out that this model works well for Pre-Kindergarten through grade six, because the teachers are generalists. However, the model is not appropriate for middle school and high school when teachers are frequently more knowledgeable about the subject and how to teach it than the principal is.

Instructional leadership is present in this theory as the community of practice solidifies and teachers are negotiating the meaning of standards, instructional methods, and CFA results. As a result of these activities, teachers become instructional leaders for each other. When teachers are not able to be instructional leaders for each other, they are able to identify their own gaps and request external instructional leadership. Teachers as instructional leaders (as opposed to Principals as instructional leaders) within a PLC resolve the issue in High Schools wherein Principals are not able to be instructional leaders in ALL disciplines.

Transformational, distributed, and instructional leadership are critical to the success of PLC development. However, the current literature focuses on these as management attributes of identified manager-leaders whereas the theory presented in Chapter 5 demonstrates that all of these styles and types of leadership are present in a successful PLC that is functioning as a community of practice.

6.3. Theorizing PLCs through Community of Practice

Currently, professional learning communities and communities of practice are perceived as separate models of knowledge management vehicles that change teacher practice. Blankenship and Ruona (2007) provided a comparison of the models and a review of the literature on communities of practice and professional learning communities. They compared three models of professional learning communities (described in Section 2.3.10 – DuFour, Eaker and Many's PLCs, Whole-Faculty Study Groups, and Communities of Continuous Inquiry and Improvement) and three models of communities of practice (CoPs). The three models of communities

of practice Blankenship and Ruona identified were distinguished by the authors that wrote about them:

- Brown and Duguid: These authors describe communities of practice as somewhat naturally occurring within teams as they attempt to resolve issues within their work context.
- Wenger, McDermott, and Snyder: These authors discuss the cultivation of communities of practice within many types of organizations. These instances of communities of practice are defined by having a domain, community, and practice. This work is based on Lave and Wenger (1991) and on Wenger (1998). NOTE: this is the type of community of practice referenced in this literature review.
- Saint-Onge and Wallace: These authors have based their instance of communities of practice in knowledge management theory. They indicate that there are three types of communities of practice (informal, supported, structured) and that all types have these features: practice, people, and capabilities.

In Blankenship and Ruona (2007), compare these six instances of communities for learning (3 PLCs and 3 CoPs) along the lines of: 1) theory base; 2) membership; 3) leadership; 4) organizational culture; 5) knowledge sharing. The authors conclude that each type of community has different structure and goals and that the lack of consistency is what makes it difficult for school leaders to operationalize the implementation of any of them.

Defining PLCs and CoPs along the lines of theory base, membership, leadership, and organizational culture may be overcomplicating the concepts. Wenger, McDermott, and Snyder (2002) defined elements of a community of practice (see Section 2.3.7) that are broad enough to include nearly any combination of theory base, membership, leadership, and organizational structure. According to Wenger, et. al., the three key components of a community of practice are 1) Domain; 2) Community; 3) Practice.

The domain for a professional learning community is clear – improved student learning. For some PLCs this is achieved through data-based discussions about student achievement while others achieve it through collaborative learning opportunities. For DuFour, Eaker, and Many (2006), this is achieved through ensuring schools and districts enact practices to answer the Four Critical Questions.

1. What is it we want students to learn?
2. How will we know if students have learned it?
3. What will we do if students have not learned?
4. How will we deepen the learning for students who have already mastered essential knowledge and skill? (Hinman, 2006)

The community (or membership) of a community of practice, according to the literature is usually defined as being a sub-group of the larger organization. However, a PLC's membership may be the whole school or district, one grade in one school in a district or several grades or subjects in a school in a district, or even a landscape of communities of practice (Etienne Wenger, 2015) across the whole district.

One major difference in the community's membership between communities of practice and professional learning communities is that the members of a community of practice usually self-select into the community, while a PLC requires that every member of the school or district participate. Current literature indicates that communities of practice can be formed intentionally but that this is usually the result of a management decision that has the potential to impact the autonomy for learning originally envisaged for communities of practice (N. Thomas, 2017).

The practice of a PLC for some PLC authors is difficult to define, because there is no vehicle through which the teachers are able to define their practice. For example, Hord (1997) only mentions that the teachers should share what they do with each other (shared practice). For the data-based PLCs, their practice is determined by the centrality of data in their *raison d'être*. DuFour, Eaker and Many's version of a PLC allows the practice to be defined by the teachers in the PLC as it works out how to answer the Four Critical Questions, which are focused on student learning. The Four Critical Questions provide each PLC the opportunity to define their learning practice.

In summary (Table 31: PLC as Community of Practice), the community of a DuFour, Eaker, and Many PLC is the teachers and educational support staff. The domain embodied within a PLC is learning—for both the teachers and the students. Practice, in a PLC, is the activities that the community enact to define their practice.

Table 31: PLC as Community of Practice

Community of Practice Elements (Etienne Wenger et al., 2002)	Professional Learning Community
Domain	Improved student learning
Community	All education related employees of a school or district
Practice	Learning

Even though PLCs were not developed using communities of practice theory, they have been shown above to be closely related to communities of practice. As such, the concerns about communities of practice (raised in Section 2.3.8) need to be considered when researching PLCs. One of the key concerns about communities of practice is that of teacher identity and power (Fuller et al., 2005; Handley et al., 2006). This is particularly important to consider when studying PLCs, as membership is a requirement. This has the potential to disenfranchise and disempower participants.

Additionally, PLCs are nearly always part of a wider system. If the PLC is a group of grade level teachers, they are usually working within a school and a district. Handley et al. (2006) raised issues about the wider, cultural settings that also impact communities of practice. This is particularly important to pay attention to with PLCs, because the wider cultural setting for PLCs consists of the policies and procedures that drive and organize the district, school, and grade level groups.

Lastly, Fuller et al. (2005) and Edwards (2005) raised issues about individual learning in communities of practice. That is, how is individual learning within communities of practice identified and assessed? This has the potential to be a large issue resulting from current policy (Race to the Top legislation) requiring the evaluation of teachers based on their students' standardized test scores. While ESSA has returned determination of evaluation measures to the States, evaluating teacher effectiveness is still a requirement (Close et al., 2018; Sawchuk, 2016). Assessing learning and effectiveness is not a simple task. One recommendation from the National Education Policy Center is to "Emphasize data useful as formative feedback in state systems, so that specific weaknesses in student learning can be identified, targeted and used to inform teachers' professional development.(Close et al., 2018, p. 4)" PLCs have the potential to do this, as they are designed to incorporate formative assessment as feedback on teacher capabilities. Perhaps incorporating Edwards' (2005) assessment

concept (assessing how learners use concepts to address new problems) could enhance the formative feedback obtained.

As discussed in Section 2.3.8, some research has indicated potential issues with communities of practice as appropriate for teacher professional development (Edwards, 2005; Fuller et al., 2005). However, as Cox (2005) pointed out, there are at least four different types of communities of practice. The work of Edwards (2005) and Fuller et. al. (2005) is based on Lave and Wenger (1991), while the research in this thesis includes support from Wenger (1998). Wenger (2000) addresses many of these issues by reminding us of the inherent tension between learning and doing. He calls for a social discipline of learning that addresses the tensions between and within power and identity by identifying systems and conceptual tools to address the issues more directly. This social discipline of learning does “all this from a social learning perspective, that is, with a primary focus on understanding and enhancing learning capability in social systems” (Etienne Wenger, 2000, p. 11).

6.3.1. PLCs as Learning Organizations and PLCs as a Specific Type of Community of Practice

Research and writing by the key authors in Professional Learning Communities seeks to understand where and how learning happens in professional learning communities (Richard DuFour et al., 2006; Hord & Tobia, 2012; Milbrey McLaughlin et al., 2003; Stoll & Louis, 2008). The concepts and constructs they work with in their inquiry are closely aligned to those found in communities of practice theory, but not based on communities of practice theory. Some examples of the similarity are the concepts of shared vision and values and shared personal practice which are compared to communities of practice theory and this theory in Section 6.2.1.1

Another element in the literature is that some authors are focusing on creating a learning organization for its own sake while others are creating a learning organization to support a change in teacher practice. For example, Hord (1997; 2012), Stoll (2006; 2008), Louis (1995; 2008), and the researchers working with them, write about the creation of the PLC as creating a learning organization that has specific features. This type of learning organization may or may not change teacher practice. While DuFour, Eaker,

and Many (2015; 2006; 2003) also have the creation of a learning organization as their focus, their research and examples show that changing teacher practice to focus on student learning creates the PLC learning organization as a support to changing teacher practice. It so happens that this change in teacher practice and the learning organization that is created as a result is also a specific type of community of practice.

The difference in these two approaches may be seen in the rubrics developed to evaluate progress. The examples below seem to demonstrate that Hord and Tobia (2012, p. 50) are focused on developing a PLC that is a learning organization while DuFour, Eaker, and Many (2006, pp. 82–83) are focused on changing teacher practice that leads to a learning organization that is a specific type of community of practice:

Table 32: Comparison of PLC Rubrics

Authors	Hord & Tobia	DuFour, Eaker, and Many
Goal	Engages in continuous intentional and collective learning.	We acknowledge that the fundamental purpose of our school is to help all students achieve high levels of learning, and therefore, we work collaboratively to clarify what students must learn and how we will monitor each student's learning.
Indicator	Explores a wide variety of student data sources to identify areas of students' needs for improvement; establishes, with colleagues, a focus for change in teaching/learning practices that address students' needs; determines collaboratively what teachers will need to learn; decides collectively how teachers will do this learning; participates in the learning; plans with the PLC members how new practice will be implemented in classrooms and how student learning will be assessed; uses evidence of student learning to review, assess, and revise implementation	<ul style="list-style-type: none"> We work with colleagues on our team to build shared knowledge regarding state, provincial, and/or national standards; district curriculum guides; trends in student achievement; and expectations for the next course or grade level. This collective inquiry has enabled each member of our team to clarify what all students must know and be able to do as a result of every unit of instruction. We work with colleagues on our team to clarify the criteria by which we will judge the quality of student work, and we practice applying those criteria until we can do so consistently. We monitor the learning of each student's attainment of all

Authors	Hord & Tobia	DuFour, Eaker, and Many
	activities and adjusts instruction based on that review.	essential outcomes on a timely basis through a series of frequent, team-developed, common formative assessments that are aligned with high stakes assessments students will be required to take.

Hord & Tobia’s goal is written in unmeasurable terms (Engages in continuous intentional and collective learning) while DuFour, Eaker, and Many’s goal is clear and specific and measurable. In addition, DuFour, Eaker, and Many’s goal identifies the change in practice that is in progress. (We acknowledge that the fundamental purpose of our school is to help all students achieve high levels of learning, and therefore, we work collaboratively to clarify what students must learn and how we will monitor each student’s learning.) In the DuFour, Eaker, and Many goal, the purpose of the collaboration is specified and student learning is the most important learning. This type of goal helps to create the specific type of community of practice wherein teacher learning will both result in and be driven by ensuring student learning. Whereas, in Hord and Tobia’s goal, the purpose of the collaboration is listed as learning, but the purpose of the learning is not defined.

Within the context of this divide, the theory in this thesis leverages community of practice theory and aligns itself with DuFour, Eaker, and Many’s approach to creating a learning organization. The theory in this thesis aligns itself with DuFour, Eaker, and Many by focusing on the following things: 1) the importance of focusing on student learning as the change in practice driver to create the supporting learning organization that is a specific type of community of practice; 2) the importance of collaboratively answering the Four Critical Questions as the key activities of the new practice; 3) the importance of everyone taking responsibility for student learning which creates the shared repertoire, joint enterprise, and mutual engagement of this specific type of community of practice.

It is within these contexts that this theory fits and works. It is not a surprise that this theory relies on and mirrors much of DuFour, Eaker, and Many’s concepts, because most of the districts and schools that participated in this study modeled themselves after DuFour, Eacker, and Many’s direction.

Had this study been based on PLCs developed under Hord or Stoll, it may have identified different results.

6.3.2. The Benefits of PLCs as a Specific Type of Community of Practice

While most of the literature on PLCs is focused on creating a learning organization, DuFour, Eaker, and Many’s approach to creating a learning organization has operationalized the creation in such a way that it changes teacher practice. Their focus is not on learning in general it is specifically focused on student learning (see Table 32: Comparison of PLC Rubrics). As such, schools or districts that implement DuFour, Eaker, and Many’s structures are more likely to change teacher practice. Two of the key elements of DuFour, Eaker, and Many processes are:

- Mission /Vision Statements that allow teachers to determine and reify their understanding of the new practice.
- Collaboratively answering the Four Critical Questions allows teachers to participate in defining and reifying their practice thereby creating a specific type of community of practice

This discussion focuses specifically on two critical features (mission and vision and collaboration) of DuFour, et. al.,’s writing. Using the emerging grounded theory and existing theory on communities of practice further develops “the theoretical understanding of this phenomenon.(Torraco, 2002, p. 365)”

Communities of practice develop and function based on community coherence fostered through the creation of joint enterprise, mutual engagement, and shared repertoire (Etienne Wenger, 1998). Adding the lens of communities of practice theory to the design and development of PLCs provides structure and language to the aspects of PLC design that are not explained by organizational learning theory. In order to demonstrate the connections between PLC activities and community of practice development, this section is organized in these (Table 33) comparisons:

Table 33: Comparison of CoP and PLC Elements

Community of Practice Element	PLC Element
Joint enterprise	Mission and Vision
Mutual engagement	Collaboration

Community of Practice Element	PLC Element
Shared repertoire	Collaboration

6.3.2.1. Joint Enterprise from Mission and Vision Statements

The theory that emerged from this study identified two critical aspects of 'joint enterprise' that writing mission and vision statements accomplish. The first is to create community coherence by negotiating the meaning of focusing on student learning. As PLCs begin to develop, they spend time learning about focusing on student learning and defining for themselves what that means. This takes the form of creating mission and vision statements based on focusing on student learning in order to create coherence to a common goal within the community. In social learning theory, this is defining the joint enterprise.

The second critical aspect of 'joint enterprise', which writing mission and vision statements creates, is the definition of competence. By writing mission and vision statements, teachers define the way they will behave to create the school that will achieve the stated purpose. In social learning theory this is defining the mutual accountability of the community. Wenger (1998, p. 78) states, "It is not just a stated goal, but creates among participants relations of mutual accountability that become an integral part of the practice." Defining the joint enterprise puts boundaries around what is considered to be 'good practice.' In the case of PLCs, the boundary is student learning as opposed to teaching.

It is easy to consider writing mission and vision statements a passing phase, one more box to tick, or another scheme that one must outwait for it to go away. However, when the community creates the mission and vision statements, it is the beginning of negotiating the meaning of their practice. Putting it into this context allows teachers to realize the impact of the activity as well as gives teachers initial practice in negotiating meaning.

6.3.2.2. Mutual Engagement from Collaboration

Mutual engagement in practice is another source of coherence in the community. "Practice does not exist in the abstract. It exists because people are engaged in actions whose meanings they negotiate with one another.

(Etienne Wenger, 1998, p. 73)” The theory presented in Chapter 5 indicates that mutual engagement in the joint enterprise of focusing on student learning for PLCs takes the form of collaborating (working jointly together with others) on the Four Critical Questions. DuFour, Eaker, and Many (2006) make the point that collaboration, on its own, is not necessarily a benefit. Rather, one must define the aspects around which teachers will collaborate. They call this “the right work.” Social learning theory defines “the right work” as negotiated practice (i.e., what the community agrees is the right work – mission and vision statements) and refines the meaning of collaboration to “mutual engagement.”

As discussed in this theory, mutual engagement is more than meeting together to discuss students and how to improve their learning or to discuss schedules. Mutual engagement occurs when one is invited to engage in the important aspects of the practice. In DuFour, Eaker, and Many’s PLC implementation, the right work (the important aspect) is answering the Four Critical Questions. When teachers participate in this collaboration, they are mutually engaged in the important work of the community of practice and community coherence is achieved.

The tight focus of the Four Critical Questions helps to create mutual engagement as the activities needed to answer the questions define the key tasks of the practice. The most effective communities of practice (e.g., apprenticeships), have been able to define their joint enterprise in such a way that the tasks that create mutual engagement are well defined.

6.3.2.3. *Shared Repertoire from Collaboration*

Shared repertoire is the last element of community coherence and, as the theory in this thesis indicates, it is demonstrated in PLC development as the activities that allow teachers to answer the Four Critical Questions. The mutual engagement needed to create the pacing guides that answer “What will students learn?” and create the common formative assessments that answer “How will we know when they have learned it?” simultaneously create a shared repertoire. The shared repertoire is mutually negotiated as teachers determine how to interpret the standards, create a shared curriculum, create common formative assessments, and how to meet the needs of the students.

As this theory indicates, shared repertoire also embodies the structure of meeting formats, document formats, and intervention activities that drive conversations and result from decisions made. Each PLC will create its own reification of these activities and processes. DuFour, Eaker, and Many's PLC implementation indicate that it is through participation in these activities that teachers learn. Community of practice theory agrees and expands on that by indicating that repertoire "includes the discourse by which members create meaningful statements about the world, as well as the styles by which they express their forms of membership and their identities as members (Etienne Wenger, 1998, p. 83)." It is through the negotiation of meaning in answering the Four Critical Questions that learning occurs, cognition changes, and practice advances (Barnett, 2016; Million Chauraya & Brodie, 2018).

Collaborating to write mission and vision statements and to answer the Four Critical Questions create the community of practice structure needed to create community coherence through mutual engagement around a joint enterprise that creates a shared repertoire.

6.4. Conditions and Context Discussion

Recent literature reviews of PLC research identify the need to understand the conditions and contexts of creating PLCs and sustaining continuous improvement in a learning organization (Bolam et al., 2005; Hiron et al., 2013; Jones & Thessin, 2015). They propose research agendas that elucidate the specific causes, conditions, and contexts that create and sustain change. This three-phase theory, rich in context and conditions, goes some way to filling the gap in understanding the conditions and context by which PLCs create and sustain change.

By the nature of the grounded theory research approach, theories developed using grounded theory include explanations of conditions and context via relating concepts to each other along dimensional ranges. These relationships involve causal, contextual, and intervening conditions that impact actions and interactions of people in a process. As a result, the theory described in Chapter 5 provides conditions and contexts for creating PLCs and sustaining continuous improvement.

The theory described in Chapter 5 provides macro and micro discussions of the causes, contexts, and intervening conditions of the

actions/interactions of each phase that result in a specific behavioral outcome. At the macro level, the phases demonstrate the conditions and contexts needed to move from a focus on teaching in individual classrooms to a community of practice focused on student learning. At the micro level, each phase is broken down into specific structures and processes that were conceptualized in the data. In all cases, communities of practice theory plays a part in explaining the change process and associated learning.

6.5. Summary and Conclusion

The goal of this Chapter was to compare the theory that emerged through the grounded theory study with current literature. To that end, the researcher

- Compared and contrasted the theory presented in Chapter 5 with key writings about PLC elements and educational change
- Theorized the relationship between PLCs as learning organizations and PLCs as a specific type of community of practice
- Used the theory presented in Chapter 5 to discuss how the three elements of the community of practice concept of community coherence are developed using two concepts from DuFour, Eaker, and Many's (2006) work on developing PLCs.
- Discussed the ways in which the theory identifies conditions and contexts for creating and sustaining effective PLCs.

The discussion of PLCs as a specific type of community of practice has the potential to provide new insight into the activities enacted within a PLC. This theory begins to explain how collaboration around practice drives and sustains continuous improvement. When one understands community of practice theory, one understands that members of the PLC engage in something far more important and powerful than collaboration. "It's not necessarily collaboration you want, it's the maximizing of your learning potential. And doing that requires an artful mix of engaging diverse voices, stimulating people's imagination to what's possible, and creating horizontal alignment among them.(Wenger-Trayner, 2016)" This is demonstrated in the examples provided in Sections 6.3.2.2 and 6.3.2.3 above.

Jones and Thessin, in their review of the literature about the change process schools undergo to sustain PLCs state, "The establishment of

effective PLCs within a learning organization, however, relies largely on the actions and support of school leaders.(Jones & Thessin, 2015, p. 194)” The research presented herein agrees that school leaders may instigate the initial change. However, the theory presented in this thesis demonstrates that it does not ‘rely largely” on the management structure of the district or school as Jones and Thessin seem to imply. Rather, as the specific type of community of practice forms, leadership (transformational, distributed, or instructional) becomes a function of the community. Without the understanding of how communities of practice work, one might miss critical signals about how and when to transfer leadership away from district and school leaders and into the community of practice. By overlaying communities of practice theory in the theory that emerged in this study, the theory provides potential markers to signal these transitions.

Chapter 7: Discussion, Conclusions, and Implications

7.1. Introduction

The study presented in this thesis began with a literature review focused on teacher professional development practices, teacher change practices, and situated learning theory practices as set in the context of educational reform initiatives in the United States. This provided the context of the study to understand how Professional Learning Communities function to create effective professional development.

The researcher chose grounded theory as the study methodology based on several factors of the study:

- The study purpose was to understand the context and processes within PLCs that create effective teacher change
- The researcher's epistemological stance is that learning is socially constructed
- The process under study potentially involved social learning theory

The very nature of the study forced the researcher to reflexively deal with her own subjectivity regarding the study. That is, in choosing the methodology, the researcher identified her epistemological stance to provide context (Section 3.2.3). Additionally, the researcher provided description of her positionality at the beginning of the study description 3.7.5.1) to provide an audit trail (Gasson, 2004) that aids in understanding the conclusions drawn. Lastly, as the constant comparative method of grounded theory requires, the researcher memoed theoretical hypotheses in order to surface and document subjectivity to ensure the data wasn't forced into existing theory but could emerge from the researcher's own theoretical sensitivity.

This chapter provides a review of the findings that focuses on contributions to the field, the significance of this research, and the limitations of this research. It provides discussion about the significance of the grounded theory within the thesis about creating and sustaining change in teacher practice as well as recommendations for future research that this theory

suggests. The chapter concludes with the researcher's experiences while conducting research using grounded theory.

7.2. Review of Findings

7.2.1. Conclusions

This research study began with a need to develop a theoretical understanding of change in teacher practice within a Professional Learning Community. The stated purpose of the study:

The purpose of this study was to understand the context and conditions within PLCs that create and sustain change in teacher practice and, from that understanding, create a theory of teacher change in practice with explanatory and predictive power.

There were two key discoveries in this theory:

- 1) The changes happen in a three-phase process that can provide a framework for developing PLCs that change teacher practice
- 2) The PLC forms a specific type of community of practice that provides the conditions and context for the changes in practice

It is the elements of the specific type of community of practice, created during the three-phase process of developing the PLC, which may create learning and change. When these are paired with the systems thinking at the heart of organizational learning, districts and schools may change their focus from teaching to learning, incorporate action research processes to ensure continuous improvement, and create a system that sustains change based on learning.

7.2.2. Findings

Given that the PLCs in this study were heavily influenced by Richard DuFour's work on developing PLCs (Richard DuFour et al., 2006), it is not surprising that many of those elements are part of this theory as well. "Learning by Doing" is primarily about the organizational development activities needed to move from the current teaching paradigm to a functioning

PLC that is focused on student learning (the new paradigm). This research, which studied multiple PLC implementations, conceptions, and documentation to generate the theory, supports the affordances discussed in the book and recommends that districts and schools continue to use it. However, this research provides leaders and teachers with the processes and structures that result in the consequence of their actions/interactions at any given stage. This is the value of the three-phase framework.

The discovery of the PLC as a specific type of community of practice provides language and framework for understanding the reason the activities create learning and change in teachers and their practices. Negotiation of meaning is the most important aspect of the community of practice for learning and change. As mentioned in Chapter 6, affordances in “Learning by Doing”, such as defining the joint enterprise via mission and vision statements, are part of the negotiation of meaning. While writing the mission and vision statements is the goal, it is the discussion that arises that is more important than the words to which they agree. The mission and vision become the reification of the teacher’s participation in creating them.

Negotiation of meaning is also the goal of the Four Critical Questions around which “Learning by Doing” drives the rest of their affordances. Every aspect of answering the Four Critical Questions is a negotiation of meaning. For example, in order to answer the question “What will students learn?” teachers must negotiate the meaning of the standards. This creates learning as the teachers come to agreement – some teachers learn what other teachers may have already known while other teachers gain new understanding of what the standards are not. Once this understanding is negotiated, the teachers embark on negotiating the meaning of the pacing guide and its contents. The pacing guides are the reification of the meanings negotiated as teachers participated in their practice of understanding the standards and creating a pacing guide as a result.

Lastly, the theory presented in this thesis identifies four leadership tasks (McDonald & Savage, 2016) that are a function of the community of practice and occur over the course of the three phases.

- A. Focus the enterprise on student learning instead of teaching methods to create a community of learners

- B. Model the desired learning and collaboration behaviors across the enterprise to create reciprocal accountability and trust across the community
- C. Build the community of learners by facilitating enterprise-wide process improvements:
 - a. Make changes to schedules and providing time blocks for teaching and collaboration
 - b. Be the link between the classroom and administration requirements
- D. Create a coaching culture whereby sharing knowledge is valued to sustain the community

7.2.3. Contribution

The main contribution of this research study is a substantive, mid-range theory that provides a potential framework for how effective PLCs form and create teacher change in practice that improves student performance. This change is demonstrated through a three-phase model that puts forth a series of processes and structures that may affect the change in teacher practice. The framework uses communities of practice theory to explain the conditions and context for teacher learning that changes practice.

As discussed in Section 5.5.2 (Why build theory?), theoretical contributions should be original and useful (Corley & Gioia, 2011). As demonstrated in Figure 64: Theoretical Contribution Ranges, original theories fall within a range from incremental to revelatory while useful theories fall within a range from practically useful to theoretically useful.

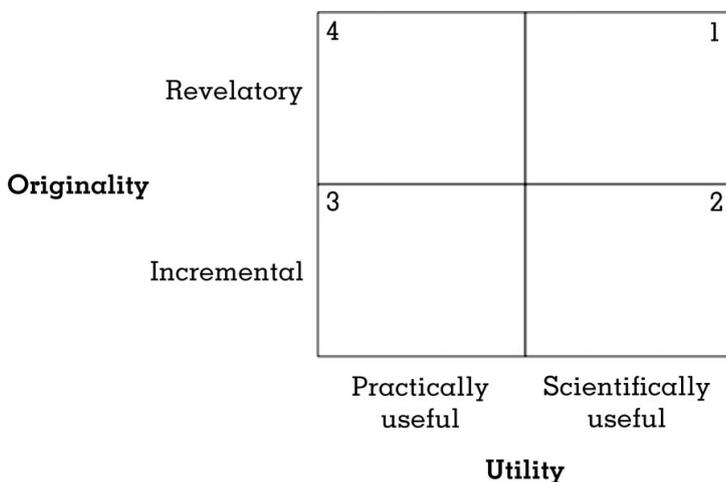


Figure 64: Theoretical Contribution Ranges (Corley & Gioia, 2011)
McDonald, Barbara

The theory presented in this thesis is scientifically useful and incrementally original, because, while it reinforces that learning occurs in PLCs it goes beyond by beginning to explain how and where learning occurs.

Additionally, the theory presented in this thesis is scientifically useful and revelatory original, because it provides a theoretical framework for why and how teacher learning occurs. Having a framework or operational construct assists the field in designing professional learning to support the improvement of teacher practice.

Lastly, the theory presented in this thesis is practically useful and revelatory original, because, the addition of communities of practice theory fills gaps in understanding how and when teachers learn within a PLC. The addition of communities of practice theory is significant, because it raises awareness in Professional Learning Communities practitioners about the points of learning within the PLC development and maintenance process. It is also significant, because it places the focus of learning in the practice of teaching.

7.2.4. Reflection on Findings and Contribution to Scholarly Literature

Since PLCs were developed based on organizational and knowledge management theory as opposed to communities of practice theory, the task of theorizing PLCs as a specific type of community of practice provided a significant expansion of my understanding of both PLCs and communities of practice. That the DuFour, Eaker, and Many implementation requires teachers to redefine their practice for themselves thereby creating the community coherence through joint enterprise, mutual engagement, and shared repertoire helps us think about teacher change in terms of their mutually defined practice as opposed to cognitive gaps in understanding.

Since this study began, research has been conducted around practice-based professional development especially as it relates to the disciplines (K. R. Harris et al., 2015; McKeown et al., 2019; Osborne et al., 2019; Roth et al., 2018; Rovio-Johansson, 2018). This research is designed to expand teacher's understanding of the practice they teach (i.e., Science, Writing, Mathematics, etc.) through enacting and reflecting on specific elements of the practice as they are defined by those in the practice and in order to help others learn the

practice. What I found in my study supports this approach. As one of this study's participants said, "You can't specifically teach what you don't specifically know." The result of this study aids in setting expectations about how professional development providers might more effectively fit into the process of teacher change.

Osborne et. al., (2019) reference Ball and Cohen's recommendation to design PD around specific teaching practices. When one considers this recommendation in light of teachers working within a PLC, one sees that PLC members have defined their practice and are in the best position to identify their learning needs. It also removes the need to "select or create materials that document these activities, and then use the materials to create opportunities for teachers to learn the target activities" (Osborne et al., 2019, p. 1077). In a well-functioning PLC the members will have identified their practices and defined their target activities. This allows the teachers to drive their own learning through either internal or external resources. Buy-in is a given as they are asking for the support and change in practice, because they will use the learning opportunity to further negotiate and define their practice. This may impact professional development providers positioning them as consultants whose service is defined primarily by the teachers requesting their support.

7.2.5. Significance

The significance of this study is 1) it provides conditions and context for creating and sustaining teacher change through PLCs; 2) it extends the existing literature by adding the lens of community of practice theory to explain how and where learning happens.

This research contributes to the body of knowledge of effective professional development by reinforcing the value of PLCs as a change agent as well as by placing the locus of professional development design in the practice of teaching. The framework provides opportunities for further definition of designs that improve teacher change and other types of research to expand our understanding of effective professional development.

7.2.6. Limitations of the Research

The primary limitation of this study is the substantive nature of the theory. The research included PLCs primarily from one district that resulted in a substantive, as opposed to formal, theory. Formal theory requires a higher level of data gathering that was outside of the scope of this study.

A further limitation of the study is that there is no data from failed or failing PLCs. While the theory discusses dimensional ranges in some places, consistent references to them were removed from the revised version as a return to the data determined that there was not enough evidence to retain them. A broader study that included failed or failing PLCs might produce more clarity around conditions and context.

A final limitation of this study is that it offers no method of measurement of teacher learning or change at various points within the PLC process of answering The Four Critical Questions. The DuFour, Eaker, and Many implementation of PLCs uses improved standardized test scores to measure teacher learning or change.

7.3. Future Research

As stated previously, this theory meets Lynham's (2002) criteria to address the first two phases of the theory building process: concept development and operationalizing. As the theory was developed from practice via "carefully obtained data/findings and experiential knowledge that are used to confirm, or disconfirm, and further refine and develop the existing theory and to enhance the utility of the theory in practice (Lynham, 2002, p. 230)," it meets the requirements for a conceptual theory that operationalizes causes, conditions, and contexts within which teacher change in practice is created and sustained. However, in order to complete Lynham's Cycle of Applied Theory-Building (Figure 65), the theory should also be applied and put through tests of confirmation or disconfirmation in order to allow for the continuous refinement and development of the theory.

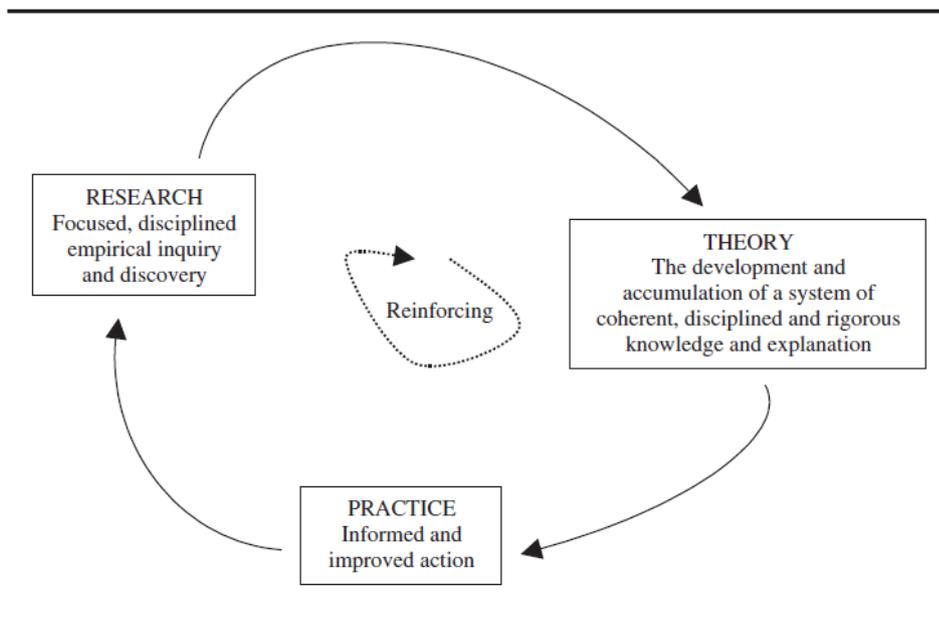


Figure 65: Lynham's (2002) Growth Cycle of Applied Theory-Building

Future research might examine the application of communities of practice theory in existing and developing PLCs. This research would help PLC builders to understand how to implement the PLC activities in a way that creates learning and change in the teachers as called for by Wilson (2013).

Given that the Phases of Change in this theory provide specific conditions and contexts for the identified actions and interactions, future research might validate various aspects of the phases. This validation may also be undertaken in the context of providing more detail to the current list of elements of effective teacher professional development (Darling-Hammond et al., 2017; L. M. Desimone, 2009) in the service of providing more specificity for design decisions (Osborne et al., 2019; Suzanne M. Wilson, 2013).

Future research might also compare the specific structures created using Hord and Stoll's conception of PLCs versus those created using DuFour, Eaker, and Many in order to identify similarities and differences that impact the success or failure of the PLCs under study.

Currently, there are no specific Federal or State policies support DuFour, Eaker and Many style PLCs nor evaluating teachers within those PLCs. This research may help inform future teacher evaluation policy in that Vescio, et. al., (2008) have determined that teachers practicing within the PLC framework change practice and improve student outcomes. In addition, practice-based professional development is appropriate for changing teacher

practice within a PLC framework. With ESSA providing States more authority to define teacher evaluations models, it's possible that these concepts of practice-based learning will drive new models for teacher evaluation.

7.4. Reflections on Grounded Theory Methods

It has been noted that grounded theory is not an easy methodology to undertake (Gasson, 2004; Roy Suddaby, 2006). Gasson stated, "a grounded theory approach is not recommended unless you are really enthusiastic about your topic. It demands a great deal more energy, time and commitment than any other method I know.(2004, p. 100)" A good portion of that energy and time is spent undertaking the analytic reflexivity required to ensure that data drive theory emergence as opposed to the data being forced into existing theory. This was particularly important for this theory as the researcher was well-acquainted with communities of practice theory prior to beginning the study, and one of the critical discoveries was that PLCs are also a specific type of community of practice. It, therefore, is appropriate to conclude this thesis with a little more reflexivity regarding this researcher's first experience with grounded theory. This section will focus on two key moments of personal discovery.

7.4.1. Identifying relational statements

The first key moment of personal discovery involved the shift from categorization and conceptualization to identifying relational statements. Describing categories of concepts clearly using the properties and dimensional ranges identified as part of the categorization and pattern-finding process was straightforward. However, it took approximately six months of writing and re-writing about the relationships to finally understand what relational statements looked like. Once the relationships started to emerge, I realized that some of the difficulty I was having writing relational statements was that concepts had one relationship early in the PLC development process and a different relationship later in the PLC development process. This became particularly clear when I considered the concept of 'professional development'. This moment of personal discovery, in turn, led to the theory emerging into three phases with specific conditions, contexts, and outcomes. At this point, writing about the relationship of the categories, sub-categories, properties, and dimensions was like flood waters breaching the dam.

7.4.2. The importance of reflexivity during analysis

As mentioned above, I approached the analysis process with a great deal of reflexivity around communities of practice concepts. The analysis process consisted of grouping concepts and arranging and rearranging them in mindmaps as a way to write the story of the concept. It was tempting to use community of practice terms to represent concepts, but I steadfastly avoided that and tried to find a word to represent the concept from within the data itself or a maybe a phrase to represent a transition or change. The lived experience of the study participants was the goal.

What I didn't anticipate was that the study participants were immersed in the language and concepts learned through seminars and books written by Richard DuFour. This came out in the data. Concepts like Focusing on Student Learning, Collaboration, Learning, and Results appeared in the codes over and over. Some of the early analytic pattern finding had these concepts at the center of the categorization process. Reflexive memos aided in moving past forcing the data into these concepts and letting my own theoretical sensitivity guide their use. It is noted that Focusing on Student Learning was sufficiently significant and unique to maintain its status as a key category.

7.5. Enthusiasm about the topic

Ultimately, it was enthusiasm for the topic of teacher learning in communities of practice that kept me dedicated to the grounded theory process until the end. During my research work, I worked full-time, raised two children, and moved three times (one of them trans-Atlantic). I've spoken to other PhD students who have considered doing a grounded theory study. I said to them what Gasson said above – only do grounded theory if you are really passionate about your topic, because that will be the only thing that gets you through to the end. You will flounder in the middle and want to quit; enthusiasm for what you are finding is the only thing that will make you get up at 6:30 a.m. every Saturday for three years so you can write your theory.

References

- Akerson, V. L., Cullen, T. A., & Hanson, D. L. (2009). Fostering a community of practice through a professional development program to improve elementary teachers' views of nature of science and teaching practice. *Journal of Research in Science Teaching*, 46(10), 1090–1113.
<https://doi.org/10.1002/tea.20303>
- Apply to Be a Model PLC | All Things PLC | Powered by Solution Tree*. (n.d.). Retrieved November 26, 2014, from <http://www.allthingsplc.info/evidence-submission-online>
- Backman, K., & Kyngäs, H. A. (1999). Challenges of the grounded theory approach to a novice researcher. *Nursing & Health Sciences*, 1(3), 147–153. a9h.
- Barab, S., MaKinster, J., & Scheckler, R. (2004). Designing System Dualities. In S. A. Barab, R. Kling, & J. H. Gray (Eds.), *Designing for virtual communities in the service of learning*. Cambridge University Press.
- Barlex, D. (2005). The centrality of designing: An emerging realization from three curriculum projects. *Technology Education and Research: Twenty Years in Retrospect, Conference Proceedings, ITEA 67 Th Annual Conference*.
- Barnett, E. (2016). *How Teachers Negotiated the Meaning of Next Generation Science Standards (NGSS) Through Participation in a Professional Learning Community* [Ph.D., University of Missouri - Columbia].
<http://search.proquest.com/docview/2153825876#>
- Battersby, S. L., & Verdi, B. (2015). The Culture of Professional Learning Communities and Connections to Improve Teacher Efficacy and Support Student Learning. *Arts Education Policy Review*, 116(1), 22–29. a9h.

- Becker, P. H. (1993). Common Pitfalls in Published Grounded Theory Research. *Qualitative Health Research, 3*(2), 254–260.
<https://doi.org/10.1177/104973239300300207>
- Berkovich, I., & Eyal, O. (2017). The mediating role of principals' transformational leadership behaviors in promoting teachers' emotional wellness at work: A study in Israeli primary schools. *Educational Management Administration & Leadership, 45*(2), 316–335.
<https://doi.org/10.1177/1741143215617947>
- Blankenship, S. S., & Ruona, W. E. (2007). Professional Learning Communities and Communities of Practice: A Comparison of Models, Literature Review. *Online Submission*.
<http://eric.ed.gov/?id=ED504776>
- Bolam, R., Great Britain, & Department for Education and Skills. (2005). *Creating and sustaining effective professional learning communities*. DFES Publications.
- Boote, D., & Beile, P. (2005). Scholars Before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation—EDUCATIONAL RESEARCHER. *Educational Researcher, 34*(6), 3–15. <https://doi.org/10.3102/0013189X034006003>
- Borko, H. (2004). Professional Development and Teacher Learning: Mapping the Terrain. *Educational Researcher, 33*(8), 3–15.
- Borko, H., Elliott, R., & Uchiyama, K. (2002). Professional development: A key to Kentucky's educational reform effort. *Teaching and Teacher Education, 18*(8), 969–987. [https://doi.org/10.1016/S0742-051X\(02\)00054-9](https://doi.org/10.1016/S0742-051X(02)00054-9)
- Borko, H., Whitcomb, J., & Liston, D. (2009). Wicked Problems and Other Thoughts on Issues of Technology and Teacher Learning. *Journal of Teacher Education, 60*(1), 3–7.
<https://doi.org/10.1177/0022487108328488>

- Bradford, A. (2015, March 23). *Deductive Reasoning vs. Inductive Reasoning*. LiveScience. <http://www.livescience.com/21569-deduction-vs-induction.html>
- Brown, J. S., & Duguid, P. (1991). Organizational Learning and Communities-of-Practice: Toward a Unified View of Working, Learning, and Innovation. *Organization Science*, 2(1), 40–57.
- Button, K., Cox, K., Stough, R., & Taylor, S. (2002). The long term educational needs of a high-technology society. *Journal of Education Policy*, 17(1), 87–107. <https://doi.org/Article>
- Charmaz, K. (2014). *Constructing grounded theory* (2nd edition). Sage.
- Clarke, D., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, 18(8), 947–967. [https://doi.org/doi:DOI: 10.1016/S0742-051X\(02\)00053-7](https://doi.org/doi:DOI:10.1016/S0742-051X(02)00053-7)
- Close, K., Amrein-Beardsley, A., & Collins, C. (2018). State-Level Assessments and Teacher Evaluation Systems after the Passage of the Every Student Succeeds Act: Some Steps in the Right Direction. *National Education Policy Center*. <https://nepc.colorado.edu/publication/state-assessment>
- Cobb, P., & Bowers, J. (1999). Cognitive and Situated Learning Perspectives in Theory and Practice. *Educational Researcher*, 28(2), 4–15.
- Cobb, P., McClain, K., de Silva Lamberg, T., & Dean, C. (2003). Situating teachers' instructional practices in the institutional setting of the school and district. *Educational Researcher*, 32(6), 13–24.
- Cohen, B. P. (1980). *Developing sociological knowledge: Theory and method*. Prentice-Hall.
- Conole, G., de Laat, M., Dillon, T., & Darby, J. (2008). “Disruptive technologies”, “pedagogical innovation”: What’s new? Findings from an in-depth study of students’ use and perception of technology.

Computers & Education, 50(2), 511–524.

<https://doi.org/10.1016/j.compedu.2007.09.009>

Corbin, J., & Strauss, A. (2008). *Basics of Qualitative Research* (3rd ed.).

Sage Publications.

Corley, K. G., & Gioia, D. A. (2011). BUILDING THEORY ABOUT THEORY

BUILDING: WHAT CONSTITUTES A THEORETICAL

CONTRIBUTION? *Academy of Management Review*, 36(1), 12–32.

both.

Cox, A. (2005). What are communities of practice? A comparative review of

four seminal works. *Journal of Information Science*, 31(6), 527–540.

<https://doi.org/10.1177/0165551505057016>

Creswell, J. (2008). *Educational Research: Planning, Conducting, and*

Evaluating Quantitative and Qualitative Research (3rd ed.). Pearson.

Creswell, J. W. (2005). *Educational research: Planning, conducting, and*

evaluating quantitative and qualitative research (2nd ed). Merrill.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed*

methods approaches. Sage.

Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing*

Among Five Approaches. SAGE.

Creswell, J. W., Hanson, W. E., Clark Plano, V. L., & Morales, A. (2007).

Qualitative Research Designs. *The Counseling Psychologist*, 35(2),

236–264. <https://doi.org/10.1177/0011000006287390>

Curran, F. C., & Kellogg, A. T. (2017). Sense-making of Federal Education

Policy: Social Network Analysis of Social Media Discourse around the

Every Student Succeeds Act. *Journal of School Leadership*, 27(5),

622–651. ofm.

Darling-Hammond, L., Hyster, M. E., & Gardner, M. (2017). Effective teacher

professional development. *Palo Alto, CA: Learning Policy Institute*.

- Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies That Support Professional Development in an Era of Reform. *Phi Delta Kappan*, 76(8), 597–604.
- Darling-Hammond, L., & Richardson, N. (2009). Teacher Learning: What Matters? *Educational Leadership*, 66(5), 46–53. a9h.
- Dee, T. S., & Jacob, B. (2011). The impact of no Child Left Behind on student achievement. *Journal of Policy Analysis & Management*, 30(3), 418–446. bth.
- Dennis, D. V. (2017). Learning From the Past: What ESSA Has the Chance to Get Right. *Reading Teacher*, 70(4), 395–400. eft.
- Denzin, N. K. (Ed), & Lincoln, Y. S. (Ed). (2000). Grounded Theory: Objectivist and Constructivist Methods. In *Handbook of qualitative research* (2nd ed., pp. 509–535). Sage Publications, Inc.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The Sage handbook of qualitative research* (4th ed). Sage.
- Desimone, L. M. (2009). Improving Impact Studies of Teachers' Professional Development: Toward Better Conceptualizations and Measures. *Educational Researcher*, 38(3), 181–199.
<https://doi.org/10.3102/0013189X08331140>
- Desimone, Laura M. (2011). A Primer on Effective Professional Development. *Phi Delta Kappan*, 92(6), 68–71. <https://doi.org/Article>
- Desimone, Laura M., & Pak, K. (2017). Instructional Coaching as High-Quality Professional Development. *Theory Into Practice*, 56(1), 3–12. eft.
- Desimone, Laura M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of Professional Development on Teachers' Instruction: Results from a Three-Year Longitudinal Study. *Educational Evaluation and Policy Analysis*, 24(2), 81–112.
- Developing the Standards | Next Generation Science Standards*. (n.d.). Retrieved June 10, 2018, from

<https://www.nextgenscience.org/developing-standards/developing-standards>

Development Process | Common Core State Standards Initiative. (n.d.).

Retrieved June 10, 2018, from <http://www.corestandards.org/about-the-standards/development-process/>

Drysdale, L., & Gurr, D. (2011). Theory and practice of successful school leadership in Australia. *School Leadership & Management, 31*(4), 355–368. <https://doi.org/10.1080/13632434.2011.606273>

DuFour, Rebecca. (n.d.). *About PLCs | All Things PLC™ | Powered by Solution Tree.* Retrieved April 5, 2014, from <http://www.allthingsplc.info/about>

DuFour, Richard. (2007). Professional learning communities: A bandwagon, an idea worth considering, or our best hope for high levels of learning? *Middle School Journal, 39*(1), 04.

DuFour, Richard. (2015). How PLCs Do Data RIGHT. *Educational Leadership, 73*(3), 22–26. eft.

DuFour, Richard, DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing.*

DuFour, Rick. (2003). Leading edge:" Collaboration lite" puts student achievement on a starvation diet. *Journal of Staff Development, 24*(3), 63–64.

Duignan, P., & Cannon, H. (2011). *The power of many: Building sustainable collective leadership in schools.* Aust Council for Ed Research.

Easton, L. B. (2008). From Professional Development To Professional Learning. *The Phi Delta Kappan, 89*(10), 755–761. <https://doi.org/10.2307/40792272>

Edwards, A. (2005). Let's get beyond community and practice: The many meanings of learning by participating. *Curriculum Journal, 16*(1), 49–65. a9h.

- Egan, T. M. (2002). Grounded theory research and theory building. *Advances in Developing Human Resources*, 4(3), 277–295.
- Fataar, P. A., & Feldman, D. J. (2016). Dialogical habitus engagement: The twists and turns of teachers' pedagogical learning within a professional learning community. *Perspectives in Education*, 34(3).
<https://doi.org/10.18820/2519593X/pie.v34i3.8>
- Fendt, J., & Sachs, W. (2008). Grounded Theory Method in Management Research: Users' Perspectives. *Organizational Research Methods*, 11(3), 430–455. <https://doi.org/10.1177/1094428106297812>
- Fitzgerald, B., & Howcroft, D. (1998). Towards dissolution of the IS research debate: From polarization to polarity. *Journal of Information Technology*, 13, 313–326.
- Fontana, A., & Frey, J. (1994). The art of science. *The Handbook of Qualitative Research*, 361–376.
- Fullan, M. (1985). Change Processes and Strategies at the Local Level. *The Elementary School Journal*, 85(3), 391–421.
<https://doi.org/10.1086/461411>
- Fullan, M. (1994). *Change Forces: Probing the Depths of Educational Reform. School Development and the Management of Change Series: 10.* (Falmer Press, Taylor & Francis Inc., 1900 Frost Road, Suite 101, Bristol, PA 19007.). eric.
<http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED373391&scope=site>
- Fullan, M. (2005). *Leadership & sustainability: System thinkers in action.* Corwin Press.
- Fullan, M. (2009). Leadership Development: The Larger Context. *Educational Leadership*, 67(2), 45–49. a9h.
- Fullan, M. (2010). The Big Ideas behind Whole System Reform. *Education Canada*, 50(3), 24–27. eft.

- Fullan, M., Bertani, A., & Quinn, J. (2004). New Lessons for Districtwide Reform. *Educational Leadership*, 61(7), 42–46. eft.
- Fullan, M., & Knight, J. (2011). Coaches as System Leaders. *Educational Leadership*, 69(2), 50–53. eric.
- Fuller, A., Hodkinson, H., Hodkinson, P., & Unwin, L. (2005). Learning as peripheral participation in communities of practice: A reassessment of key concepts in workplace learning. *British Educational Research Journal*, 31(1), 49–68. <https://doi.org/10.1080/0141192052000310029>
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B., & Yoon, K. S. (2001). What Makes Professional Development Effective? Results From a National Sample of Teachers. *Americ*, 38(4), 915–945.
- Gasson, S. (2004). Qualitative Field Studies. *The Handbook of Information Systems Research*, 79.
- Gil, A. J., Carrillo, F. J., & Fonseca-Pedrero, E. (2019). Assessing a learning organization model: A teacher's perspective. *Management in Education*, 33(1), 21–31. <https://doi.org/10.1177/0892020618783815>
- Glaser, B. G. (1999). The Future of Grounded Theory. *Qualitative Health Research*, 9(6), 836–845.
<https://doi.org/10.1177/104973299129122199>
- Glaser, Barney G. (1978). *Theoretical Sensitivity. Advances in the Methodology of Grounded Theory*. The Sociology Press.
- Glaser, Barney G. (1998). *Doing grounded theory: Issues and discussions* (Vol. 254). Sociology Press Mill Valley, CA.
- Glaser, Barney G. (2002a). Conceptualization: On Theory and Theorizing Using Grounded Theory. *International Journal of Qualitative Methods*.
<http://ejournals.library.ualberta.ca/index.php/IJQM/article/view/4605/37>
57
- Glaser, Barney G. (2002b). Constructivist Grounded Theory? *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research; Vol*

- 3, No 3 (2002): *Subjectivity and Reflexivity in Qualitative Research I*.
<http://www.qualitative-research.net/index.php/fqs/article/view/825/1792>
- Glaser, Barney G. (2004). "Naturalist Inquiry" and Grounded Theory. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research; Vol 5, No 1 (2004): Special Issue: FQS Reviews III*. <http://www.qualitative-research.net/index.php/fqs/article/view/652>
- Glaser, Barney G. (2016). The Grounded Theory Perspective: Its Origins and Growth. *Grounded Theory Review*, 15(1), 4–9. bth.
- Glaser, Barney G., & Holton, J. (2004). Remodeling Grounded Theory. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research; Vol 5, No 2 (2004): Qualitative Market, Media and Opinion Research*.
<http://www.qualitative-research.net/index.php/fqs/article/view/607/1315>
- Glaser, Barney G., & Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for qualitative research*. Aldine Transaction.
- Glazer, E., & Hannafin, M. (2006). The collaborative apprenticeship model: Situated professional development within school settings. *Teaching and Teacher Education*, 22(2), 179–193.
<https://doi.org/10.1016/j.tate.2005.09.004>
- Greeno, J. G. (1997). Response: On Claims That Answer the Wrong Questions. *Educational Researcher*, 26(1), 5–17.
- Guskey, T. R. (1984). The Influence of Change in Instructional Effectiveness upon the Affective Characteristics of Teachers. *American Educational Research Journal*, 21(2), 245–259.
- Guskey, T. R. (1986). Staff Development and the Process of Teacher Change. *Educational Researcher*, 15(5), 5–12.
- Guskey, T. R. (2003). What Makes Professional Development Effective? *The Phi Delta Kappan*, 84(10), 748–750.
- Hairon, S., Goh, J. W. P., & Lin, T.-B. (2013). Distributed leadership to support PLCs in Asian pragmatic Singapore schools. *International Journal of*

Leadership in Education, 17(3), 370–386.

<https://doi.org/10.1080/13603124.2013.829586>

Hallinger, P. (2003). Leading Educational Change: Reflections on the practice of instructional and transformational leadership. *Cambridge Journal of Education*, 33(3), 329–352.

<https://doi.org/10.1080/0305764032000122005>

Hallinger, P., & Kovačević, J. (2019). A Bibliometric Review of Research on Educational Administration: Science Mapping the Literature, 1960 to 2018. *Review of Educational Research*, 89(3), 335–369.

<https://doi.org/10.3102/0034654319830380>

Handley, K., Sturdy, A., Fincham, R., & Clark, T. (2006). Within and beyond communities of practice: Making sense of learning through participation, identity and practice. *Journal of Management Studies*, 43(3), 641–653.

Harris, J. B., & Hofer, M. J. (2011). Technological Pedagogical Content Knowledge (TPACK) in Action: A Descriptive Study of Secondary Teachers' Curriculum-Based, Technology-Related Instructional Planning. *Journal of Research on Technology in Education*, 43(3), 211–229. <https://doi.org/Article>

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types: Curriculum-based Technology Integration Reframed. *Journal of Research on Technology in Education*, 41(4), 393–416.

<https://doi.org/Article>

Harris, K. R., Graham, S., & Adkins, M. (2015). Practice-based professional development and Self-Regulated Strategy Development for Tier 2, at-risk writers in second grade. *Contemporary Educational Psychology*, 40, 5–16. <https://doi.org/10.1016/j.cedpsych.2014.02.003>

- Heath, H., & Cowley, S. (2004). Developing a grounded theory approach: A comparison of Glaser and Strauss. *International Journal of Nursing Studies*, 41(2), 141–150. [https://doi.org/10.1016/S0020-7489\(03\)00113-5](https://doi.org/10.1016/S0020-7489(03)00113-5)
- Heck, D. J., Banilower, E. R., Weiss, I. R., & Rosenberg, S. L. (2008). Studying the Effects of Professional Development: The Case of the NSF's Local Systemic Change through Teacher Enhancement Initiative. *Journal for Research in Mathematics Education*, 39(2), 113–152. <https://doi.org/10.2307/30034894>
- Heller, R. (2018). Big money and its influence on K-12 education: An interview with Sarah Reckhow. *Phi Delta Kappan*, 99(8), 41–45. rgm.
- Herbert, S., & Rainford, M. (2014). Developing a model for continuous professional development by action research. *Professional Development in Education*, 40(2), 243–264. <https://doi.org/10.1080/19415257.2013.794748>
- Hinman, C. (2006). Developing a Substantive Professional Learning Community. *National Forum of Educational Administration and Supervision Journal*, 24(1), 29–35.
- Hipp, K., Huffman, J., Pankake, A., & Olivier, D. (2008). Sustaining professional learning communities: Case studies. *Journal of Educational Change*, 9(2), 173–195.
- Hirsh, S. (2009). A New Definition. *Journal of Staff Development*, 30(4), 10–16. eft.
- Hoare, K. J., Mills, J., & Francis, K. (2012). Dancing with data: An example of acquiring theoretical sensitivity in a grounded theory study. *International Journal of Nursing Practice*, 18(3), 240–245. <https://doi.org/10.1111/j.1440-172X.2012.02038.x>
- Home | Common Core State Standards Initiative. (n.d.). Retrieved April 5, 2014, from <http://www.corestandards.org/>

- Honig, M. I. (2012). District Central Office Leadership as Teaching: How Central Office Administrators Support Principals' Development as Instructional Leaders. *Educational Administration Quarterly*, 48(4), 733–774. <https://doi.org/10.1177/0013161X12443258>
- Hord, S. M. (1997). *Professional learning communities: Communities of continuous inquiry and improvement*.
- Hord, S. M. (1998). Creating a Professional Learning Community: Cottonwood Creek School. *Issues about Change*, 6(2), n2.
- Hord, S. M., & Southwest Educational Development Laboratory (Eds.). (2004). *Learning together, leading together: Changing schools through professional learning communities*. Teachers College Press ; National Staff Development Council.
- Hord, S. M., & Tobia, E. F. (2012). *Reclaiming our teaching profession: The power of educators learning in community*. Teachers College Press.
- Huffman, J. B. (2011). Professional Learning Communities in the USA: Demystifying, Creating, and Sustaining. *International Journal of Learning*, 17(12), 321. edb.
- Hunter, A., Murphy, K., Grealish, A., Casey, D., & Keady, J. (2011). Navigating the grounded theory terrain. Part 1. *Nurse Researcher*, 18(4), 6–10. a9h.
- J L. (2015, June 19). *Cognitivism*. Learning Theories. <https://www.learning-theories.com/cognitivism.html>
- Jacob, B. (2017a). THE CHANGING FEDERAL ROLE IN SCHOOL ACCOUNTABILITY. *Journal of Policy Analysis & Management*, 36(2), 469–477. bth.
- Jacob, B. (2017b). THE POTENTIAL AND LIMITS OF FEDERAL POLICY: A RESPONSE TO LADD. *Journal of Policy Analysis & Management*, 36(2), 480–483. bth.

- Jones, C. M. 1, & Thessin, R. A. 2. (2015). A REVIEW OF THE LITERATURE RELATED TO THE CHANGE PROCESS SCHOOLS UNDERGO TO SUSTAIN PLCS. *Planning & Changing*, 46(1/2), 193–211. eft.
- Judah, M.-L., & Richardson, G. H. (2006). Between a rock and a (very) hard place: The ambiguous promise of action research in the context of state mandated teacher professional development. *Action Research*, 4(1), 65–80. <https://doi.org/Article>
- Kanger, L. (2016). From General Patterns to Middle-range: A Proposal for a Top-down Theorizing Strategy. *Sociology*, 50(3), 502–521. <https://doi.org/10.1177/0038038515587640>
- Kelle, U. (2005). “Emergence” vs. “Forcing” of Empirical Data? A Crucial Problem of “Grounded Theory” Reconsidered. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research; Vol 3, No 3 (2002): Subjectivity and Reflexivity in Qualitative Research I*, 6(2). http://chelt.anu.edu.au/sites/default/files/hero/emergencevsforcing_empiricaldata_Kelle_2005.pdf
- Kimble, C., & Bourdon, I. (2008). Some success factors for the communal management of knowledge. *International Journal of Information Management*, 28(6), 461–467. <https://doi.org/10.1016/j.ijinfomgt.2008.08.007>
- Kruse, S. D., & Louis, K. S. (1995). *Professionalism and community: Perspectives on reforming urban schools*. Corwin Press; eft. <http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eft&AN=68823228&scope=site>
- Ladd, H. F. (2017). NO CHILD LEFT BEHIND: A DEEPLY FLAWED FEDERAL POLICY. *Journal of Policy Analysis & Management*, 36(2), 461–469. bth.
- Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge University Press.

- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.
- Lawless, K. A., & Pellegrino, J. W. (2007). Professional Development in Integrating Technology Into Teaching and Learning: Knowns, Unknowns, and Ways to Pursue Better Questions and Answers. *Review of Educational Research*, 77(4), 575–614.
<https://doi.org/10.3102/0034654307309921>
- Lawrence, J., & Tar, U. (2013). The use of Grounded Theory Technique as a Practical Tool for Qualitative Data Collection and Analysis. *Electronic Journal of Business Research Methods*, 11(1), 29–40. bth.
- Lawrence, L. J., & Lawrence, P. E. (1999). Reculturing for Collaboration and Leadership. *The Journal of Educational Research*, 92(4), 237–242.
- LeCompte, M. D. (2010). *Designing & conducting ethnographic research: An introduction* (2nd ed). AltaMira Press.
- Lo, C. O. (2016). Literature integration: An illustration of theoretical sensitivity in grounded theory studies. *The Humanistic Psychologist*, 44(2), 177–189. <https://doi.org/10.1037/hum0000029>
- Locke, E. A. (2007). The Case for Inductive Theory Building†. *Journal of Management*, 33(6), 867–890.
<https://doi.org/10.1177/0149206307307636>
- Louis, K. S., & Kruse, S. D. (1995). *Professionalism and community: Perspectives on reforming urban schools*. SAGE Publications Ltd.
- Louis, K. S., Mayrowetz, D., Murphy, J., & Smylie, M. (2013). Making Sense of Distributed Leadership: How Secondary School Educators Look at Job Redesign. *International Journal of Educational Leadership and Management*, 1(1), 33–68. eric.
- Luckerhoff, J., & Guillemette, F. (2011). The Conflicts between Grounded Theory Requirements and Institutional Requirements for Scientific Research. *The Qualitative Report*, 16(2), 396–414.

- Lynham, S. A. (2002). The general method of theory-building research in applied disciplines. *Advances in Developing Human Resources*, 4(3), 221–241.
- Malone, S. (2003). Ethics at home: Informed consent in your own backyard. *International Journal of Qualitative Studies in Education*, 16(6), 797–815. <https://doi.org/10.1080/09518390310001632153>
- Mauthner, N. S., & Doucet, A. (2003). Reflexive Accounts and Accounts of Reflexivity in Qualitative Data Analysis. *Sociology*, 37(3), 413–431. <https://doi.org/10.1177/00380385030373002>
- McCarley, T. A., Peters, M. L., & Decman, J. M. (2016). Transformational leadership related to school climate: A multi-level analysis. *Educational Management Administration & Leadership*, 44(2), 322–342. <https://doi.org/10.1177/1741143214549966>
- McClain, K., & Cobb, P. (2004). The critical role of institutional context in teacher development. *Proceedings of the 28th Conference of the International*, 3, 281–288. http://www.emis.ams.org/proceedings/PME28/RR/RR299_Mcclain.pdf
- McCreaddie, M., & Payne, S. (2010). Evolving Grounded Theory Methodology: Towards a discursive approach. *International Journal of Nursing Studies*, 47(6), 781–793. <https://doi.org/10.1016/j.ijnurstu.2009.11.006>
- McDonald, B., & Savage, T. (2016, April). Key Leadership Tasks that Develop and Sustain Effective Professional Learning Communities. *Public Scholarship to Educate Diverse Democracies*. AERA Annual Meeting, Washington, D.C.
- McKellar, K. A., Pitzul, K. B., Yi, J. Y., & Cole, D. C. (2014). Evaluating Communities of Practice and Knowledge Networks: A Systematic Scoping Review of Evaluation Frameworks. *EcoHealth*, 11(3), 383–399. <https://doi.org/10.1007/s10393-014-0958-3>

- McKeown, D., FitzPatrick, E., Brown, M., Brindle, M., Owens, J., & Hendrick, R. (2019). Urban teachers' implementation of SRSD for persuasive writing following practice-based professional development: Positive effects mediated by compromised fidelity. *Reading and Writing, 32*(6), 1483–1506. <https://doi.org/10.1007/s11145-018-9864-3>
- McLaughlin, Milbrey, Talbert, J., & Center for the Study of Teaching and Policy, S., WA. (2003). *Reforming Districts: How Districts Support School Reform. A Research Report. Document R-03-6* (Center for the Study of Teaching and Policy (CTP). University of Washington, Box 353600, Seattle, WA 98195-3600. Tel: 206-221-4114; Fax: 206-616-8158; e-mail: ctpmail@u.washington.edu; Web site: <http://www.ctpweb.org>). Center for the Study of Teaching and Policy; eric.
- <http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED499090&site=eds-live>
- McLaughlin, MilbreyW., & Mitra, D. (2001). Theory-based Change and Change-based Theory: Going Deeper, Going Broader. *Journal of Educational Change, 2*(4), 301–323.
- <https://doi.org/10.1023/A:1014616908334>
- McNamee, M. (2001). Introduction: Whose Ethics, Which Research? *Journal of Philosophy of Education, 35*(3), 309. a9h.
- Meijs, C., Prinsen, F. R., & de Laat, M. F. (2016). Social learning as approach for teacher professional development; how well does it suit them? *Educational Media International, 53*(2), 85–102. a9h.
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
- Michaud, R. (2016). The Nature of Teacher Learning in Collaborative Data Teams—ProQuest. *The Qualitative Report, 21*(3), 529–545.

- Miller, W. L. (1999). *Doing qualitative research* (Vol. 3). Sage.
<http://books.google.com/books?hl=en&lr=&id=4ebxYPyY5noC&oi=fnd&pg=PR9&ots=7y931bYuLE&sig=GwvJKiKQ2-XFagff2sjTTJffqus#v=onepage&q&f=false>
- Million Chauraya, & Brodie, K. (2018). Conversations in a Professional Learning Community: An Analysis of Teacher Learning Opportunities in Mathematics. *Pythagoras*, 39(1). eric.
<http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ1209131>
- Mills, J., Bonner, A., & Francis, K. (2006). The Development of Constructivist Grounded Theory. *International Journal of Qualitative Methods*, 5(1).
- Mjøset, L. (2005). CHALLENGES TO GROUNDED THEORY. *37th World Congress of the International Institute of Sociology*, 15.
- Murphy, C. U., & Lick, D. W. (1998). *Whole-Faculty Study Groups. A Powerful Way To Change Schools and Enhance Learning*. (Corwin Press, Inc., A Sage Publications Company, 2455 Teller Road, Thousand Oaks, CA 91320 (Paper \$29.95).). eric.
<http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED422318>
- Murphy, J., Smylie, M., Mayrowetz, D., & Louis, K. S. (2009). The role of the principal in fostering the development of distributed leadership. *School Leadership & Management*, 29(2), 181–214.
<https://doi.org/10.1080/13632430902775699>
- Nappi, J. S. 1, jstegmaiern@rider. edu. (2014). The Teacher Leader: Improving Schools by Building Social Capital through Shared Leadership. *Delta Kappa Gamma Bulletin*, 80(4), 29–34. eft.
- Next Generation Science Standards*. (n.d.). Retrieved June 24, 2017, from <https://www.nextgenscience.org/>

- Nicole A. Bannister. (2018). Theorizing Collaborative Mathematics Teacher Learning in Communities of Practice. *Journal for Research in Mathematics Education*, 49(2), 125.
<https://doi.org/10.5951/jresematheduc.49.2.0125>
- Ontology. (n.d.). In *Merriam-Webster.com*. Merriam-Webster.
<http://www.merriam-webster.com/dictionary/ontology>
- Osborne, J. F., Borko, H., Fishman, E., Gomez Zaccarelli, F., Berson, E., Busch, K. C., Reigh, E., & Tseng, A. (2019). Impacts of a Practice-Based Professional Development Program on Elementary Teachers' Facilitation of and Student Engagement With Scientific Argumentation. *American Educational Research Journal*, 56(4), 1067–1112.
<https://doi.org/10.3102/0002831218812059>
- Patton, K., & Parker, M. (2017). Teacher education communities of practice: More than a culture of collaboration. *Teaching and Teacher Education*, 67, 351–360. <https://doi.org/10.1016/j.tate.2017.06.013>
- Penner-Williams, J., Díaz, E. I., & Gonzales Worthen, D. (2017). PLCs: Key PD component in learning transfer for teachers of English learners. *Teaching and Teacher Education*, 65, 215–229.
<https://doi.org/10.1016/j.tate.2017.03.014>
- Penuel, W. R., Riel, M., Joshi, A., Pearlman, L., Kim, C. M., & Frank, K. A. (2010). The Alignment of the Informal and Formal Organizational Supports for Reform: Implications for Improving Teaching in Schools. *Educational Administration Quarterly*, 46(1), 57–95.
<https://doi.org/10.1177/1094670509353180>
- Penuel, William R., Frank, K. A., & Krause, A. (2006). The distribution of resources and expertise and the implementation of schoolwide reform initiatives. *Proceedings of the 7th International Conference on Learning Sciences*, 522–528.
<http://dl.acm.org/citation.cfm?id=1150110>

- Perry, C., & Jensen, O. (2001). Approaches to combining induction and deduction in one research study. *Australian and New Zealand Marketing Academy Conference Massey University, Auckland, New Zealand*.
- Peshkin, A. (1988). In Search of Subjectivity. One's Own. *Educational Researcher*, 17(7), 17–21. <https://doi.org/10.2307/1174381>
- Phillips, E., & Pugh, D. S. (2005). *How to get a PhD: a handbook for students and their supervisors* (4th ed.). Open University Press.
- Popp, J. S., & Goldman, S. R. (2016). Knowledge building in teacher professional learning communities: Focus of meeting matters. *Teaching and Teacher Education*, 59, 347–359. <https://doi.org/10.1016/j.tate.2016.06.007>
- Putnam, R. T., & Borko, H. (2000). What Do New Views of Knowledge and Thinking Have to Say about Research on Teacher Learning? *Educational Researcher*, 29(1), 4–15.
- Randolph, J. J. (2009). A guide to writing the dissertation literature review. *Practical Assessment Research Evaluation*, 14(13).
- Reis, R. (2004). What's All This About Philosophy? In *Your Undergraduate Dissertation: The Essential Guide for Success* (p. 277). Sage Publications, Inc.
- Riege, A. M. (2003). Validity and reliability tests in case study research: A literature review with “hands-on” applications for each research phase. *Qualitative Market Research: An International Journal*, 6(2), 75–86. <https://doi.org/10.1108/13522750310470055>
- Ropes, D. C. (2011). Measuring the impact of communities of practice: A conceptual model. *International Journal of Learning & Intellectual Capital*, 8(1), 94. edo.
- Roth, K. J., Wilson, C. D., Taylor, J. A., Stuhlsatz, M. A. M., & Hvidsten, C. (2018). Comparing the Effects of Analysis-of-Practice and Content-

Based Professional Development on Teacher and Student Outcomes in Science. *American Educational Research Journal*, 56(4), 1217–1253. <https://doi.org/10.3102/0002831218814759>

Rovio-Johansson, A. (2018). Experiences of practice-based learning in phenomenographic perspective. *Journal of Workplace Learning*, 30(1), 48–64. <https://doi.org/10.1108/JWL-03-2016-0017>

Royer, S. M. (2012). *Professional Learning Communities That Initiate Improvement in Student Achievement* (ProQuest LLC. 789 East Eisenhower Parkway, P.O. Box 1346, Ann Arbor, MI 48106. Tel: 800-521-0600; Web site: <http://www.proquest.com/en-US/products/dissertations/individuals.shtml>) [ProQuest LLC]. eric. <http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED549286&site=eds-live&scope=site>

Rule, P., & John, V. M. (2015). A Necessary Dialogue: Theory in Case Study Research. *International Journal of Qualitative Methods*, 14(4), 1–11. a9h.

Saultz, A., White, R., McEachin, A., Fusarelli, L., & Fusarelli, B. (2017). Teacher Quality, Distribution, and Equity in ESSA. *Journal of School Leadership*, 27(5), 652–674. ofm.

Saunders, W. M., Goldenberg, C. N., & Gallimore, R. (2009). Increasing Achievement by Focusing Grade-Level Teams on Improving Classroom Learning: A Prospective, Quasi-Experimental Study of Title I Schools. *American Educational Research Journal*, 46(4), 1006–1033. <https://doi.org/10.3102/0002831209333185>

Savage, T. (2015). *A Study of the Formation & Nature of a Community of Learners within a blended, part-time, graduate, Higher Education Programme*. Trinity College Dublin.

Savin-Baden, M., & Major, C. H. (2013). *Qualitative research: The essential guide to theory and practice*.

- Sawchuk, S. (2016, January 6). *ESSA Loosens Reins on Teacher Evaluations, Qualifications*. Education Week.
<https://www.edweek.org/ew/articles/2016/01/06/essa-loosens-reins-on-teacher-evaluations-qualifications.html?cmp=SOC-SHR-FB>
- Schildkamp, K., Poortman, C. L., & Handelzalts, A. (2016). Data teams for school improvement. *School Effectiveness and School Improvement*, 27(2), 228–254. <https://doi.org/10.1080/09243453.2015.1056192>
- Schlager, M. S., & Fusco, J. (2003). Teacher Professional Development, Technology, and Communities of Practice: Are We Putting the Cart Before the Horse? *Information Society*, 19(3), 203.
<https://doi.org/Article>
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.
- Seashore, K., Leithwood, K., Wahlstrom, K., & Anderson, S. (2010). *Investigating the links to improved student learning: Final report of research findings*. <http://conservancy.umn.edu/handle/11299/140885>
- Seashore Louis, K., & Lee, M. (2016). Teachers' capacity for organizational learning: The effects of school culture and context. *School Effectiveness and School Improvement*, 27(4), 534–556.
<https://doi.org/10.1080/09243453.2016.1189437>
- Sebastian, J., & Allensworth, E. (2012). The Influence of Principal Leadership on Classroom Instruction and Student Learning: A Study of Mediated Pathways to Learning. *Educational Administration Quarterly*, 48(4), 626–663. <https://doi.org/10.1177/0013161X11436273>
- Senge, P. M. (2006). *The fifth discipline: The art and practice of the learning organization* (Rev. and updated). Doubleday/Currency.
- Spalding, E., & Wilson, A. H. (2006). Bowling Together: Cultivating Communities of Practice in English and Social Studies Teacher Education. *English Education*, 38(2), 102–122.

- Stake, R. E. (1995). *The art of case study research*. Sage Publications.
- Stewart, C., Raskin, C., & Zielaski, D. (2012). Barriers to District-Level Educational Reform: A Statewide Study of Minnesota School Superintendents. *International Journal of Educational Leadership Preparation*, 7(3), n3.
- Stoll, L., Bolam, R., McMahon, A., Wallace, M., & Thomas, S. (2006). Professional Learning Communities: A Review of the Literature. *Journal of Educational Change*, 7(4), 221–258.
<https://doi.org/10.1007/s10833-006-0001-8>
- Stoll, L., & Louis, K. S. (2008). *Professional learning communities: Divergence, depth and dilemmas*. McGraw-Hill/Open University Press.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research* (Vol. 15). Newbury Park, CA: Sage.
- Strauss, A., & Corbin, J. (1998). *Basics of Qualitative Research* (2nd ed.). Sage Publications.
- Stutchbury, K., & Fox, A. (2009). Ethics in educational research: Introducing a methodological tool for effective ethical analysis. *Cambridge Journal of Education*, 39(4), 489–504. a9h.
- Suddaby, R. (2014). Editor's Comments: Why Theory? *Academy of Management Review*, 39(4), 407–411.
<https://doi.org/10.5465/amr.2014.0252>
- Suddaby, Roy. (2006). From the Editors: What Grounded Theory Is Not. *The Academy of Management Journal*, 49(4), 633–642.
<https://doi.org/10.2307/20159789>
- Supovitz, J., Sirinides, P., & May, H. (2010). How Principals and Peers Influence Teaching and Learning. *Educational Administration Quarterly*, 46(1), 31–56. <https://doi.org/10.1177/1094670509353043>

- Suzanne M. Wilson. (2013). Professional Development for Science Teachers. *Science*, 340(6130), 310. edsjrs.
<https://doi.org/10.1126/science.1230725>
- Swanborn, P. G. (2010). *Case study research: What, why and how?* SAGE.
- Tam, A. C. F. (2015). The role of a professional learning community in teacher change: A perspective from beliefs and practices. *Teachers and Teaching*, 21(1), 22–43.
<https://doi.org/10.1080/13540602.2014.928122>
- Tan, J. (2010). Grounded theory in practice: Issues and discussion for new qualitative researchers. *Journal of Documentation*, 66(1), 93–112.
<https://doi.org/10.1108/00220411011016380>
- Terosky, A. L. (2016). Enacting instructional leadership: Perspectives and actions of public K-12 principals. *School Leadership & Management*, 36(3), 311–332. <https://doi.org/10.1080/13632434.2016.1247044>
- Thacker, E. S. 1, thackees@wfu. edu. (2017). “PD is where teachers are learning!” high school social studies teachers’ formal and informal professional learning. *Journal of Social Studies Research*, 41(1), 37–52. eft.
- Thomas, G. (1997). What’s the use of theory? *Harvard Educational Review*, 67(1), 75–104. Social Science Premium Collection.
- Thomas, G., & James, D. (2006). Reinventing Grounded Theory: Some Questions about Theory, Ground and Discovery. *British Educational Research Journal*, 6, 767. edsjrs.
<https://doi.org/10.1080/01411920600989412>
- Thomas, N. (2017). Control and autonomy irony in communities of practice from a power-based perspective. *The Journal of Management Development*, 36(4), 466–477. ABI/INFORM Global; Social Science Premium Collection.

- TNTP. (2015). Do We Know How to Help Teachers Get Better? *The Mirage: Confronting the Hard Truth About Our Quest for Teacher Development*, 68.
- Torraco, R. J. (2002). Research methods for theory building in applied disciplines: A comparative analysis. *Advances in Developing Human Resources*, 4(3), 355–376.
- Obviously, That Worked., (September 2016).
<http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ofm&AN=120781219&scope=site>
- Vanblaere, B., & Devos, G. (2016). Relating school leadership to perceived professional learning community characteristics: A multilevel analysis. *Teaching and Teacher Education*, 57, 26–38.
<https://doi.org/10.1016/j.tate.2016.03.003>
- Verburg, R. M., & Andriessen, J. H. E. (2006). The assessment of communities of practice. *Knowledge and Process Management*, 13(1), 13–25. <https://doi.org/10.1002/kpm.241>
- Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education*, 24(1), 80–91.
<https://doi.org/doi:10.1016/j.tate.2007.01.004>
- Voulalas, Z. D., & Sharpe, F. G. (2005). Creating schools as learning communities: Obstacles and processes. *Journal of Educational Administration*, 43(2/3), 187–208. ABI/INFORM Global; Social Science Premium Collection.
- Wahlstrom, K. L., Seashore Louis, K., Leithwood, K., Anderson, S. E., & Educational Research Service. (2010). *Learning from Leadership: Investigating the Links to Improved Student Learning. The Informed Educator Series* (Educational Research Service. 1001 North Fairfax Street Suite 500, Alexandria, VA 22314. Tel: 800-791-9308; Fax: 800-

791-9309; e-mail: ers@ers.org; Web site: <http://www.ers.org>).

Educational Research Service; eric.

<http://elib.tcd.ie/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED519152&site=eds-live>

Wang, T. (2016). School leadership and professional learning community: Case study of two senior high schools in Northeast China. *Asia Pacific Journal of Education*, 36(2), 202–216.

<https://doi.org/10.1080/02188791.2016.1148849>

Ward, A., & Darling, L. F. (1996). Learning through conversation: A reflection on collaboration. *Action in Teacher Education*, 18, 80–86. eft.

Warren Little, J. (2002). Locating learning in teachers' communities of practice: Opening up problems of analysis in records of everyday work. *Teaching & Teacher Education*, 18(8), 917. <https://doi.org/Article>

Watson, C. (2014). Effective professional learning communities? The possibilities for teachers as agents of change in schools. *British Educational Research Journal*, 40(1), 18–29. ukh.

Watt, D. (2007). *On Becoming a Qualitative Researcher: The Value of Reflexivity*. 20.

Wayne, A. J., Yoon, K. S., Zhu, P., Cronen, S., & Garet, M. S. (2008). Experimenting With Teacher Professional Development: Motives and Methods. *Educational Researcher*, 37(8), 469–479.

<https://doi.org/10.3102/0013189X08327154>

Weber, R. (2004, March). The Rhetoric of Positivism Versus Interpretivism: A Personal View. *MIS Quarterly*, 1–1. bth.

Wei, R. C., Darling-Hammond, L., & Adamson, F. (2010). Professional development in the United States: Trends and challenges. *Dallas, TX: National Staff Development Council*.

<https://edpolicy.stanford.edu/sites/default/files/publications/professional-development-united-states-trends-and-challenges.pdf>

- Wei, R., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. Dallas, TX. National Staff Development Council.
- Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal*, 68(3), 1–8.
- Wenger, Etienne. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge University Press.
- Wenger, Etienne. (2000). Communities of Practice and Social Learning Systems. *Organization*, 7(2), 225–246.
<https://doi.org/10.1177/135050840072002>
- Wenger, Etienne (Ed.). (2015). *Learning in landscapes of practice: Boundaries, identity, and knowledgeability in practice-based learning*. Routledge.
- Wenger, Etienne, McDermott, R., & Snyder, W. M. (2002). *Cultivating Communities of Practice*. Harvard Business School Press.
- Wenger-Trayner, B. (2016, August 14). EBlog. *Say Boo to Collaboration and Sharing*. <http://wenger-trayner.com/reflections/say-boo-to-collaboration-and-sharing/>
- What is professional development? Definition and meaning*. (n.d.). BusinessDictionary.Com. Retrieved May 20, 2016, from <http://www.businessdictionary.com/definition/professional-development.html>
- Whitehead, J., & McNiff, J. (2006). *Action Research: Living Theory*. Sage Publications.
- Wieringa, N. (2011). Teachers' Educational Design as a Process of Reflection-in-Action: The Lessons We Can Learn From Donald Schön's The Reflective Practitioner When Studying the Professional

Practice of Teachers as Educational Designers: TEACHERS' LESSON DESIGN AS REFLECTION-IN-ACTION. *Curriculum Inquiry*, 41(1), 167–174. <https://doi.org/10.1111/j.1467-873X.2010.00533.x>

Williams, S. M., & Welsh, R. O. (2017). ESS A and School Improvement: Principal1 Preparation and Professional Development in a New Era of Education Policy. *Journal of School Leadership*, 27(5), 701–724. ofm.

Wilson, S. M., & Berne, J. (1999). Teacher Learning and the Acquisition of Professional Knowledge: An Examination of Research on Contemporary Professional Development. *Review of Research in Education*, 24, 173–209.

Wright, K. B. 1, kbwright@tamu. edu, Shields, S. M. 1, s. shields@tamu. edu, Black, K., katie. black@blinn. edu, Banerjee, M., mbanerjee@tamu. edu, & Waxman, H. C. 3, hwaxman@tamu. edu. (2018). Teacher Perceptions of Influence, Autonomy, and Satisfaction in the Early Race to the Top Era. *Percepciones de Los Maestros Sobre La Influencia, La Autonomía y La Satisfacción En La Era Race to the Top.*, 26(62/63), 1–24. eft.

Appendix A: School District Management Consent Form

TRINITY COLLEGE DUBLIN

SCHOOL DISTRICT MANAGEMENT CONSENT FORM

LEAD RESEARCHER: Barbara McDonald

BACKGROUND OF RESEARCH:

This research is investigating teacher communities of practice (face-to-face and blended) to generate a theory of the processes used to successfully integrate Professional Development events into the community's practice. It is part of a Computer Science PhD study in Trinity College Dublin.

PROCEDURES OF THIS STUDY:

The study requires access to participants in communities that are **private**. In order to maintain ethical standards, permission from the School District's Board of Education and Superintendent will be sought initially, and the researcher will work with the community leadership to determine the best approach for receiving consent from individual members. The data that is to be used are participant **interviews** and **observations**. After each round of data analysis, short **interviews** with the community leaders and appropriate participants will be held to discuss the results of the analysis and to ensure that the proper conclusions have been reached. All participant names will be anonymised in any published data so that users can keep their anonymity in any findings. Any quotes will be rephrased so that they cannot be traced back to the original user.

PUBLICATION:

The results from this research may be published in academic journals, presented at conferences and will be used as part of a PhD research thesis. However, no identifying features will be used without prior consent of the school district administrators and, if appropriate, specific participants.

DECLARATION:

- This School District Superintendent is authorized to provide consent.
- I have read a document providing information about this research and this consent form. I understand that the research **does not** require access to students.
- I have had the opportunity to ask questions and all of my questions have been answered to my satisfaction. I understand the description of the research that has been provided to me.
- I agree to provide access to teachers and community meetings and support the researcher in obtaining consent and data for analysis.
- I understand that the data gathered will be used for scientific purposes and have no objection about this data being published in scientific publications in a way that does not reveal the district's identity.
- I understand that if the researcher uncovers illicit activities, these will be reported to the appropriate authorities.
- I have read and understand the participant information and consent forms that will be provided to the teachers.
- I have received a copy of this agreement.

SCHOOL DISTRICT NAME:

SCHOOL DISTRICT SUPERINTENDENT NAME:

SCHOOL DISTRICT SUPERINTENDENT'S SIGNATURE:

Date:

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS: Barbara McDonald - mcdonabl@tcd.ie - 1 734 639 0113

INVESTIGATOR'S SIGNATURE:

Date:

TRINITY COLLEGE DUBLIN INFORMATION SHEET FOR SCHOOL BOARDS of MANAGEMENT

Study name: Communities of Practice in Support of Teacher Professional Development

Rationale for study: This research is part of a Computer Science PhD study in Trinity College Dublin. Teacher Professional Development is under great pressure to be able to create change in schools and school districts. Communities of Practice, in the form of Professional Learning Communities, are providing the best vehicle for this change. This research is investigating Professional Learning Communities and what makes them such an effective method of change in teacher practice.

Background: This research is investigating the processes and structures of Professional Learning Communities (PLCs) in order to identify a theory about the effectiveness of PLCs in managing teacher change in practice. What is the context in which this method of teacher professional development is effective? What are the processes the community follows to incorporate training events into the community in order to effect change in teacher practice? Who or what controls or drives the learning agenda? What impact does all of this have on the community?

Why your community was selected: I believe that your school district is an excellent community to research because it is a district-wide PLC, has been in existence for more than two years so that it is well-grounded in its practices, and it meets the criteria for a community of practice in that it is a community of teachers who seek to improve their practice through community-driven activities. Much research has been done around the start-up and requirements for effective communities of practice and PLCs, but little research has been done on how and why they are effective once they are up and running.

Procedures: First, consent is being solicited by the Superintendents of Schools in several communities in the mid-West of the United States for the research to take place within

a school district. The Superintendents will provide the researcher with community activity schedules and names and contact information of the community leaders.

Secondly, informal interviews (approximately 1 hour long) will be held with School Superintendent and community leaders in order for the researcher to understand the expected structure and processes for the community. These interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

Next, the researcher will identify community participants (teachers and other community participants)—criteria being grade level and/or subject—for another round of informal interviews (approximately 1 hour long). Again, these interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

If possible, the researcher will observe one or more community gatherings. She may ask clarifying questions of the participants, but no interviews will be conducted during these observations. These observations MAY be electronically recorded. If the community gathering is not recorded, the researcher will only use notes to record her observations and these will be analysed.

Lastly, at various points in the multiple cycles of interviews and observations, the researcher will conduct short, informal interviews (less than one hour) with participants and community leaders to talk about the results of the analysis and to make sure that the proper conclusions have been reached. These interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

Anonymity: Anonymity is ensured in the analysis, publication and presentation of resulting data and findings; All usernames will be anonymised in any published data so that users can keep their anonymity in any findings. Any quotes will be rephrased so that they cannot be traced back to the original user.

Voluntary nature of participation: All participation in the study is voluntary and participants are free to cease participation at any stage. This includes stopping electronic recordings at any time. In addition, participants may, at any time, even subsequent to their participation have such recordings destroyed (except in situations wherein illicit activities have been made known).

Debriefing: The Superintendent of Schools and community leaders will be shown the results of the study via a detailed report.

For further information please contact

Barbara McDonald
Dept of Computer Science and Statistics
University of Dublin,
Trinity College,
Dublin 2
Ireland
mcdonabl@tcd.ie; 1 734 639 0113 (US Phone Number)

Appendix B: Participant Consent Form

TRINITY COLLEGE DUBLIN INFORMED CONSENT FORM

LEAD RESEARCHERS: Barbara McDonald

BACKGROUND OF RESEARCH:

This research is investigating teacher communities of practice (face-to-face and blended) to generate a theory of the processes used to successfully integrate Professional Development events into the community's practice. It is part of a Computer Science PhD study in Trinity College Dublin.

PROCEDURES OF THIS STUDY:

The study requires access to participants in communities that are **private**. In order to maintain ethical standards, permission from the community leadership (School District Superintendent) will be sought initially, and the researcher will work with the community leadership to determine the best approach for receiving consent from individual members. The data that is to be used are participant **interviews** and **observations**. After each round of data analysis, short **interviews** with the community moderators and appropriate participants will be held to discuss the results of the analysis and to ensure that the proper conclusions have been reached. All participant names will be anonymised in any published data so that users can keep their anonymity in any findings. Any quotes will be rephrased so that they cannot be traced back to the original user.

PUBLICATION:

The results from this research may be published in academic journals, presented at conferences and will be used as part of a PhD research thesis. However, no identifying features will be used without prior consent of the school district administrators and, if appropriate, specific participants.

DECLARATION:

- I am 18 years or older and am competent to provide consent.
- I have read, or had read to me, a document providing information about this research and this consent form. I have had the opportunity to ask questions and all my questions have been answered to my satisfaction and understand the description of the research that is being provided to me.
- I agree that my data is used for scientific purposes and I have no objection that my data is published in scientific publications in a way that does not reveal my identity.
- I understand that if I make illicit activities known, these will be reported to appropriate authorities.
- I understand that I may stop electronic recordings at any time, and that I may at any time, even subsequent to my participation have such recordings destroyed (except in situations such as above).
- I understand that, subject to the constraints above, no recordings will be replayed in any public forum or made available to any audience other than the current researchers/research team.
- I freely and voluntarily agree to be part of this research study, though without prejudice to my legal and ethical rights.
- I understand that I may refuse to answer any question and that I may withdraw at any time without penalty.
- I understand that my participation is fully anonymous and that no personal details about me will be recorded.
- *<If the research involves viewing materials via a computer monitor>* I understand that if I or anyone in my family has a history of epilepsy then I am proceeding at my own risk.

- I have received a copy of this agreement.

PARTICIPANT'S NAME:

PARTICIPANT'S SIGNATURE:

Date:

Statement of investigator's responsibility: I have explained the nature and purpose of this research study, the procedures to be undertaken and any risks that may be involved. I have offered to answer any questions and fully answered such questions. I believe that the participant understands my explanation and has freely given informed consent.

RESEARCHERS CONTACT DETAILS: Barbara McDonald - mcdonabl@tcd.ie - 1 734 639 0113

INVESTIGATOR'S SIGNATURE:

Date:

TRINITY COLLEGE DUBLIN

INFORMATION SHEET FOR PARTICIPANTS

Study name: Communities of Practice in Support of Teacher Professional Development

Rationale for study: This research is part of a Computer Science PhD study in Trinity College Dublin. Teacher Professional Development is under great pressure to be able to create change in schools and school districts. Communities of Practice, in the form of Professional Learning Communities, are providing the best vehicle for this change. This research is investigating Professional Learning Communities and what makes them such an effective method of change in teacher practice.

Background: This research is investigating the processes and structures of Professional Learning Communities (PLCs) in order to identify a theory about the effectiveness of PLCs in managing teacher change in practice. What is the context in which this method of teacher professional development is effective? What are the processes the community follows to incorporate training events into the community in order to effect change in teacher practice? Who or what controls or drives the learning agenda? What impact does all of this have on the community?

Why your community was selected: I believe that (community name) is an excellent community to research because it is a district-wide PLC, has been in existence for more than two years so that it is well-grounded in its practices, and it meets the criteria for a community of practice in that it is a community of teachers who seek to improve their practice through community-driven activities. Much research has been done around the start-up and

requirements for effective communities of practice and PLCs, but little research has been done on how and why they are effective once they are up and running.

Procedures: First, consent is being solicited by the Superintendents of Schools in several communities in the mid-West of the United States for the research to take place within a school district. The Superintendents will provide the researcher with community activity schedules and names and contact information of the community leaders.

Secondly, informal interviews (approximately 1 hour long) will be held with School Superintendent and community leaders in order for the researcher to understand the expected structure and processes for the community. These interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

Next, the researcher will identify community participants (teachers and other community participants)—criteria being grade level and/or subject—for another round of informal interviews (approximately 1 hour long). Again, these interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

If possible, the researcher will observe one or more community gatherings. She may ask clarifying questions of the participants, but no interviews will be conducted during these observations. These observations MAY be electronically recorded. If the community gathering is not recorded, the researcher will only use notes to record her observations and these will be analysed.

Lastly, at various points in the multiple cycles of interviews and observations, the researcher will conduct short, informal interviews (less than one hour) with participants and community leaders to talk about the results of the analysis and to make sure that the proper conclusions have been reached. These interviews will be recorded and the results will be transcribed and analysed. No audio or video recordings will be made available to anyone other than the lead researcher, nor will any recordings be replayed in any public forum or presentation of the research.

Anonymity: Anonymity is ensured in the analysis, publication and presentation of resulting data and findings; All usernames will be anonymised in any published data so that users can keep their anonymity in any findings. Any quotes will be rephrased so that they cannot be traced back to the original user.

Voluntary nature of participation: All participation in the study is voluntary and participants are free to cease participation at any stage. This includes stopping electronic recordings at any time. In addition, participants may, at any time, even subsequent to their participation have such recordings destroyed (except in situations wherein illicit activities have been made known).

Debriefing: The Superintendent of Schools and community leaders will be shown the results of the study via a detailed report.

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Appendix C: List of Abbreviations

Abbreviation Stands for:

AYP	Annual Yearly Progress
CCSS	Common Core State Standards
CFA	Common Formative Assessment
CoP	Community of Practice
ESSA	Every Student Succeeds
HMH	Houghton Mifflin Harcourt
ICT	Information and Communication Technology
IMPG	Interconnected Model of Professional Growth
NCLB	No Child Left Behind
PD	Professional Development
PLC	Professional Learning Community
RTT	Race to the Top