


Summer 2014

# The relationship between teacher collaboration and student achievement

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Entitled

THE RELATIONSHIP BETWEEN TEACHER COLLABORATION AND STUDENT ACHIEVEMENT

For the degree of Doctor of Philosophy

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THE RELATIONSHIP BETWEEN TEACHER COLLABORATION AND STUDENT  
ACHIEVEMENT

A Dissertation

Submitted to the Faculty

of

Purdue University

by

Davin E. Harpe

In Partial Fulfillment of the

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of

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West Lafayette, Indiana

This dissertation is dedicated to my father and mother, Daniel and Sandra Harpe, who instilled in me the values of hard work, determination, and family; to my wife, Betsy Harpe, whose love and support have always inspired me to do and be more; to my three children, Wyatt, Charlotte, and Maggie Harpe, who serve as constant reminders that there is a loving God; and to my brothers, Brandon and Nicholas Harpe, for continuing to set the bar higher.

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I am grateful for the Indiana Association of School Principals and the Indiana Association of Public School Superintendents for indicating their support of my study, as well as the many principals across Indiana who participated. I would also like to thank my friends in cohort 16, especially Patrick Gentry, Andrew Sargent, and Eric Melnychenko, who shared their own dissertation journeys with me and provided affirmation that I was on the right path.

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family attend college, and recently celebrating more than 40 years of marriage with my mother. The example he has provided gives reason why no child in my care will be enabled to accept less than their personal best.

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## ABSTRACT

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The purpose of this concurrent embedded mixed-methods study was to develop an instrument to measure principals' perceptions of teacher collaboration in their schools. The study further examined the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. Four key components of teacher collaboration were identified through a review of the literature. Those key components of teacher collaboration included 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently.

Using a survey, quantitative and qualitative data were collected from 359 Indiana elementary and middle school principals. Quantitative data on the principals' perceptions of the presence and effectiveness of the four key components of teacher collaboration were analyzed. In order to support the quantitative data and find stronger understanding of the research, qualitative data were analyzed on how principals described teacher collaboration at their schools, including what factors impeded teacher collaboration, what factors facilitated teacher collaboration, and what relationships they perceived to exist between the quality and extent of collaboration and student achievement.

Little variability was noted in the presence of the key components of teacher collaboration – a vast majority of the principals reported these components to be in their schools. As a result of this lack of variability, no statistically significant relationships were found between the presence of the first three key components of teacher collaboration and student achievement as measured by the Indiana “A-F” Accountability Model. However, a statistically significant relationship was found between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model. Qualitative data revealed that having even just a few negative or difficult personalities on teacher teams can impede progress for the school.

When analyzing principal ratings on the effectiveness of the key components of teacher collaboration in their schools, an exploratory factor analysis enabled the researcher to find meaningful patterns within the effectiveness variables, simplify the data, and ultimately run a more meaningful multiple regression analysis. Three factors were extracted and identified as “Developing and Monitoring Specific Goals,” “Trusting, Supportive Collegiality,” and “Sharing Resources and Practices” and were tested in the three different hypotheses.

All three hypotheses tests on the relationships between the perceived effectiveness of key components of teacher collaboration and student achievement showed statistical significance. In spite of having limited variability in principal responses to the survey, all of the derived factors from the scale were significant predictors of student achievement. This study found a statistically significant relationship between principal ratings on the



effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model. Likewise, this study found a statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model. Finally, it was also determined that there is a statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.

An instrument with very high reliability was developed. This instrument can be used with principals to identify areas of weakness in teacher collaboration quickly and accurately. Although most principals endorsed most items, the tool clearly can be useful in self-evaluation of collaboration.

## CHAPTER 1

### INTRODUCTION TO THE STUDY

With labels such as “failure factories” and “take-over schools” looming, educational leaders continue to seek strategic prototypes for promoting growth in student achievement. This growth may be the difference between a school labeled as “failing” and one that earns the letter “A.” Researchers and theorists persist in reporting that productive professional learning communities (PLCs) are the catalyst for sweeping upswings in student learning data. According to Schmoker (2004), “There simply isn’t enough space here to provide the names of all the esteemed educators and organizational experts who advocate explicitly for such collaborative structures and their singular effectiveness” (p. 6). While PLCs continue to be recognized as such a key to success, the collaborative structures which support positive learning outcomes are not as widely understood or implemented.

#### *Statement of the Problem*

DuFour and Eaker (1998) asserted that developing the ability of school personnel to function as professional learning communities was the most dependable strategy for sustained, substantive school improvement. However, increased popularity of the idea of a professional learning community has caused some ambiguity in its definition. There are a variety of PLCs and other teacher collaboration models described in the literature,

and clearly the terms mean different things to different educators. Along with definitions, the practices of such teacher collaboration teams vary greatly (DuFour, 2010; Saunders, Goldenberg, & Gallimore, 2009; Vescio, Ross, & Adams, 2008).

While the actual application of professional learning communities is not as widespread as the idea, studies of schools that implement PLCs have continued to encourage such collaborative approaches (Gates & Watkins, 2010; Horn & Little, 2010; Little, 1990; Mullen & Schunk, 2010; Richmond & Manokore, 2011; Strahan, 2003). A clear problem has surfaced. A school leader looking to initiate such promising practice must be able to clearly define the components of a successful PLC for his or her organization while also providing professional development on productive teacher collaboration. That task has not been accomplished as thoroughly and as systematically as the research suggests it should be.

School leaders need manageable, precise plans of action to begin the important work of making productive teacher collaboration a part of their ongoing culture. They need an understanding of the most effective components of teacher collaboration. These key components represent a starting point and focus for effective professional development that yields collaboration among teacher teams which produces sustainable student achievement. Ultimately, school leaders need an instrument to help them assess the presence and effectiveness of these components in their schools.

Few studies have measured the relationship between key components of teacher collaboration and student achievement (Vescio et al., 2008). Much of the literature reviewed for this study included self-reports from school leaders who found success in

implementing teacher collaboration teams in their own schools or other researchers identifying schools of study and describing what elements of collaboration exist in those schools. The research on professional learning communities and teacher collaboration teams rarely takes a wide-spread approach of looking at key collaboration components present in many schools and the relationship of those components to student achievement. The literature is especially lacking in sufficient usable instruments offered to school leaders for measuring collaboration components in their schools.

### *Purpose of the Study*

The purpose of this concurrent embedded mixed-methods study was to develop an instrument to measure principals' perceptions of teacher collaboration in their schools. The study further examined the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. Key components of teacher collaboration were identified through a review of the literature. A survey was used to measure principals' perceptions of these key components in their schools. Principal ratings of the presence and effectiveness of the components of collaboration were then related to student achievement.

A concurrent embedded mixed methods design involves collecting quantitative and qualitative data at the same time and then using one of those data sources to play a supporting role of the other (Creswell, 2013). In this study, a survey was developed to collect quantitative data using a Likert-like scale to measure principals' perceptions of the presence and effectiveness of the identified key components of collaboration. Open-ended questions were also included in the survey, resulting in a mixed methods study that

collected both quantitative and qualitative data. The primary method of data collection was quantitative, with the qualitative data collection embedded in the approach to play a supportive role. Such a mixed methods approach combines the strengths of both qualitative and quantitative studies to develop a stronger understanding of the research (Creswell, 2013).

Principal ratings on the key components of collaboration were compared with student achievement as measured by Indiana “A-F” Accountability ratings to determine the relationship between perceptions of collaborative practice and learning outcomes in elementary and middle schools containing any combination of grades 3-8. The reason for collecting qualitative data from the open-ended survey questions was to more fully understand principal perceptions of collaboration, particularly as it related to student achievement.

### *Research Questions and Hypotheses*

This mixed methods study of the relationship between key components of teacher collaboration and student achievement collected both quantitative and qualitative data. The primary method of data collection was quantitative, with the qualitative data collection embedded in the approach to play a supportive role in providing further perspective in analysis. The initial research question that was answered through a review of literature was as follows:

- 1) What are the most important components of teacher collaboration?

Four key components of teacher collaboration were identified through the review of literature and have been further defined in Chapter Two. The four key components of teacher collaboration include: 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently. These four key components have been included in the hypotheses that were tested to help answer the following critical research questions that were answered through quantitative procedures:

- 1) What key components of teacher collaboration do principals see most often in their schools?
- 2) How does the presence and effectiveness of these components in collaboration among elementary teacher teams relate to student achievement?

As a result of the literature review regarding the key components of teacher collaboration, the following hypotheses were tested to provide information regarding the presence of the components as asked in the two aforementioned quantitative questions:

HO<sub>1</sub>: There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>2</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>3</sub>: There is no statistically significant relationship between principal ratings on the presence teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>4</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.

To provide information regarding the effectiveness of the components as asked in the two aforementioned quantitative research questions, an exploratory factor analysis approach was used to create the following three hypotheses:

HO<sub>5</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>6</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>7</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.

The exploratory factor analysis enabled the researcher to find meaningful patterns within the effectiveness variables, simplify the data, and ultimately run a more meaningful multiple regression analysis. The researcher found the effectiveness

variables within a large data set that related most closely with each other and might have been measuring the same thing. That “thing” became a factor, and in this study, three factors emerged. Each factor represented the combination of those overlapping effectiveness variables into a single index that measured that construct. This study found three ways of combining the effectiveness items from the survey to measure specific constructs. The three factors were identified as “Developing and Monitoring Specific Goals,” “Trusting, Supportive Collegiality,” and “Sharing Resources and Practices” and were tested in the three different hypotheses.

The following critical research questions were answered through qualitative procedures:

- 1) How do principals describe the collaboration process in their schools?
- 2) What do principals describe as the factors that impede effective collaboration in their schools?
- 3) What do principals describe as the factors that facilitate effective collaboration in their schools?
- 4) What relationship do principals perceive exists between the quality/extent of collaboration and student achievement?



Finally, the following mixed-methods research question integrated and extended the quantitative and qualitative results of the study:

- 1) To what extent do themes generated from responses to the open-ended questions help inform the measured relationship between principal perceptions of teacher collaboration in their schools and student achievement?

### *Definition of Terms*

*Professional Learning Community (PLC):* This review recognizes a PLC as “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” (DuFour, 2010, p.11).

*Interdependence:* DuFour (2006) identified working interdependently as a characteristic of a collaborative culture. Working interdependently describes a concept in which each team member is mutually dependent on the others. They support and rely on each other.

*Student Achievement:* Student achievement in this study was identified through the Indiana A-F Accountability Model, which includes a combined measurement of student performance, student growth, and student participation on ISTEP+ for English/Language Arts and Math for elementary schools.

## CHAPTER 2

### REVIEW OF THE LITERATURE

#### *Introduction*

Teacher collaboration, as this study defines it, has been called many things, including professional learning communities (DuFour, 2006, 2010; DuFour & Eaker, 1998; Graham, 2007; Hoffman, Dahlman, & Zierdt, 2009; Hord, 2009; Jacobs & Yendol-Hoppey, 2010; Joyce, 2004; Mullen & Schunk, 2010), learning communities (Haberman, 2004), critical friends groups (Burke, Marx, & Berry, 2011), communities of practice (Etienne, MacDermott, & Snyder, 2002; Printy, 2008), communities of instructional practice (Supovitz, 2002), and artisan communities (Talbert & McLaughlin, 2002). This study interchangeably uses the terms “professional learning communities” and “teacher collaboration teams” to represent the intentionally scheduled, on-going cycle of teachers working together to promote student academic growth. This review first recognizes the four key components of teacher collaboration (the independent variables of the proposed study), then it describes an analysis of previous studies conducted on teacher collaboration and student achievement, and finally offers an overall conclusion of the literature review.

As a result of being familiar with the theory of PLCs or teacher collaboration teams but not knowing exactly how to apply it, many schools have selected other

measures of reform. These other measures are often whole-school episodic updates and transfers of information that can be disconnected and untimely in relation to what teachers actually face in their classrooms. Episodic updates and transfers of information do not represent innovative professional development like collaborative professional learning does (Webster-Wright, 2009). “This decontextualization essentially disregards the value of ongoing and situated learning, thereby reinforcing the perceived divide between theory (what you learn in a course) and practice (what you do at work every day)” (Webster-Wright, 2009, p. 703).

The ideas of professional learning communities and teacher collaboration mean different things to different school leaders. For example, Cranston (2009) examined the conceptions of 12 principals on professional learning communities. While each of these principals identified establishing PLCs as imperative, their understandings of what constitutes a PLC varied considerably. Conversational routines and intentional practice in teacher discourse are important characteristics of such collaboration (Horn & Little, 2010; Little, 1990), but not having a clearly defined understanding of a PLC approach makes routines and intentional practice difficult to achieve. Nevertheless, numerous researchers suggest that developing a collaborative culture such as a PLC is the most promising strategy for sustained, substantial school improvement (Crow, Hausman, & Scribner, 2002; DuFour, Eaker, & DuFour, 2005; Hord, 2009; Schmoker, 2004). Building effective teacher collaboration teams is a complex task for school leaders, and thus, this review offers a description of the key components of collaboration (identified in

the literature) as a starting point to build upon and add applicable specificity to the practice of teachers working together to promote student growth.

#### *Four Key Components of Teacher Collaboration*

The four key components of teacher collaboration that emerged from the review of the literature include: 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently. These four elements provide a basis for clear understanding of the process and structure. Each of these components has been defined under the proceeding headings of this review. Figure 2.1 on the next page displays a map citing the literature reviewed that supports the identification of each of the key components of teacher collaboration as well as works elaborating on student growth models.

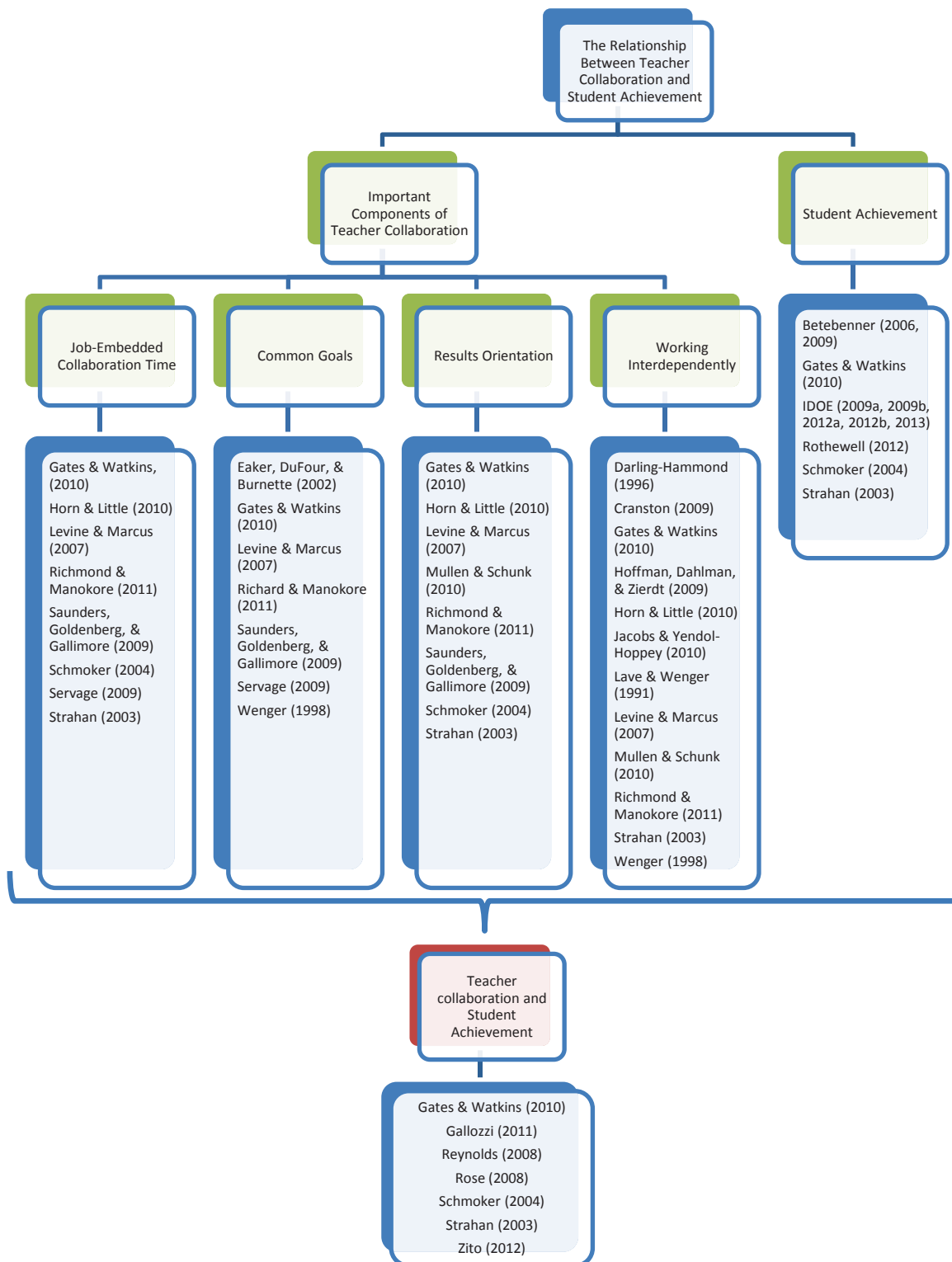


Figure 2.1

Map of Reviewed Literature

### *Component 1: Job-Embedded Collaboration Time*

Despite such clear evidence for the positive effects of professional learning communities, it is not common among schools to establish regular schedules for teachers to develop, evaluate, and adjust instructional strategies with each other (Schmoker, 2004). However, effective PLCs formalize collaborative efforts and embed them into the school day as a regular component of teachers' work (Servage, 2009). Simply claiming that the organization practices PLCs or asking teachers to collaborate on their own time does not mean that such meaningful learning and planning will occur. Research suggests that school leaders need to embed clearly scheduled meeting times and locations into the teacher work day and ensure supportive collaborative conditions are present (Hord, 2009).

The literature also suggests that is important to intentionally schedule the time, duration, and location of PLCs. Studies reviewed report productive professional learning communities meeting semiweekly, weekly, or biweekly anywhere from 40 to 90 minutes (Gates & Watkins, 2010; Horn & Little, 2010; Richmond & Manokore, 2011; Strahan, 2003). Saunders, Goldenberg, and Gallimore (2009) defined the learning teams in their study as teams who met two or three times a month for 45 to 50 minutes. They concluded that it is important for school leaders to schedule this time for teacher teams, protect it, expect that it happens, and actively participate in such a way that ensures these important meetings take place.

Time for PLCs has been scheduled a few different ways, including expecting teachers to collaborate regularly during their common planning time, hiring substitute

teachers to provide release time for collaboration, adopting an early-release or late-arrival day each week (e.g., the school board approves a district schedule that includes students getting dismissed thirty minutes early on Wednesdays), or turning staff meeting time into PLC time (DuFour, 2010; DuFour & Eaker, 1998; Eaker, DuFour, & Burnette, 2002; Gates & Watkins, 2010; Horn & Little, 2010; Schmoker, 2006; Strahan, 2003).

Depending on how the time gets scheduled, some schools are able to have all teacher teams in one room, such as the media center or a large group instruction room, which helps build a school-wide collaborative culture. Whether they are scheduled in one room or multiple rooms, these collaborative discussions are organized into departments. Teachers usually organize themselves to work collaboratively within their grade levels or specific subject areas (Horn & Little, 2010).

Simply sorting teachers into collaborative teams in a room together will not necessarily promote productive discussions. Groups need this time to develop a shared understanding and commitment to common goals, as well as the capacity and trust necessary for working and reflecting together (Levine & Marcus, 2007). In a four-year study of a school collaboration initiative, Supovitz (2002) found that communities developed are not often teams engaged in instructional improvement, and thus, just having collaboration teams does not promote student achievement. They need to intentionally use this time to establish and monitor common goals, analyze results, and effectively work interdependently.

### *Component 2: Common Goals*

In addition to job-embedded time for teacher collaboration, the framework for professional learning communities includes three big ideas: 1) Shared mission, vision, values, and goals; 2) Teachers working interdependently to achieve those common goals; and 3) A focus on results (Eaker et al., 2002). Teacher teams typically discuss common learning challenges, assessment of student understanding, strategies for student engagement, and the selection of activities collectively deemed most appropriate for increased results (Richmond & Manokore, 2011). Saunders, Goldenberg, and Gallimore (2009) observed teams that showed significant gains in student achievement as having shared and set academic goals, collaboratively developed instructional strategies for meeting these goals, and common methods and discussions about assessment. Servage (2009) went as far as to refer to them as “standardized goals.”

The first question DuFour suggests that a collaborative team asks is, “What do we want each student to learn?” (DuFour, 2004a). As a first step in a discussion protocol, this question puts the team on a path to establishing the common outcome or goal of their work. Levine & Marcus (2007, p. 134) asserted, “Without a shared vision or set of objectives, the various trajectories of learning that occur may have little synergy or coherence and thus, may not have a powerful positive impact on teaching and learning.” These common outcomes or goals should be very specific and measurable (Schmoker, 2006). For many years, a model of setting objectives and goals that are specific, measurable, attainable, realistic, and time-bound, also known as setting SMART goals, has existed for implementation among organizational leaders (Doran, 1981). School



leaders have adopted a practice of specifying their current reality of student achievement in reading and math, for example, and setting SMART goals that are Strategic and specific, Measurable, Attainable, Results-oriented, and Time-bound (Eaker et al., 2002). As Eaker et al. proposed in their book, *Getting Started: Reculturing Schools to Become Professional Learning Communities*:

For example, the first-grade team found that in the previous year, 65% of first graders earned a score of 3 or higher on the district's reading rubric at the end of the year. They agreed to raise the bar when they set the following SMART goal: "By the end of the 2000-2001 school year, 75% of first graders will score 3 or higher on the district reading rubric." (p. 45)

While the example SMART goal was more of a longer-term, annual goal, teacher collaboration teams often set shorter, more frequent goals and continue a recurring cycle of specifying objectives, adjusting instruction, and monitoring the results. The key is that each teacher team identifies what they want their students to learn, how they are going to learn it, and what they will do when they do not achieve the goals (DuFour, 2004b).

Teacher collaboration teams are composed of individuals on a common team working toward shared outcomes (Wenger, 1998). These teachers believe that all students can learn. The participants share a common vision, which includes learning from each other. They center their inquiry around "What is best for kids" (Gates & Watkins, 2010), and data-directed dialogue is engrained in the culture of that inquiry. This data-directed dialogue enables each team to connect their common goals to the actual effects, or results, of their efforts.

### *Component 3: Results Orientation*

Other patterns recognized across these studies included discussion centered on agenda items and data-directed dialogue. These agenda items target areas for instructional improvement based on student needs and accountability measures. Teacher collaboration teams must attend to the measurable outcomes of education and find specific interventions that have impact on students (Levine & Marcus, 2007). According to DuFour (2006), teams with results orientation monitor progress frequently and adjust instruction to increase its effect on student learning.

These results-oriented discussions usually begin with reviews (often called check-ins) of what has been happening in their classrooms since their last PLC meeting or PLC discussion of the topic. PLC peers then offer comments or suggestions for alternative ways of instructing those lessons. They also share resources, activities, or even work together on common assessments. In addition to sharing teaching materials and other resources, the teachers work together to ensure alignment of instruction with their common learning goals. Looking to future lessons, teachers analyze formal assessments or other evaluative measures such as classroom observations to identify areas of need and adjust instruction accordingly (Gates & Watkins, 2010; Horn & Little, 2010; Mullen & Schunk, 2010; Strahan, 2003).

The last item up for discussion typically is a summing up of the current meeting and an agreement of what they will be discussing on the next agenda. While these were common patterns noticed in the four studies by Gates & Watkins (2010), Horn & Little (2010), Richmond & Manokore (2011), and Strahan (2003), and also found in Mullen &

Schunk (2010), there is still a need for studies to show these procedures (i.e. what kinds of assessments are used, how they are used, specific structures for selecting agenda items, a specified holistic view of the PLC yearly plan, etc.) instead of just telling about them.

Productive, results-oriented professional learning communities exhibit a belief that significant improvement is possible. Excuses are replaced by strategies. Improvements are celebrated, and that celebration creates momentum and sustainability of this professional practice. Teachers strive for good teaching because it is their mission, and it is just the right thing to do (Strahan, 2003). They have developed a cultural stance of a shared orientation toward student achievement and a principle of mutual responsibility for student outcomes (Horn & Little, 2010). In addition, these educators understand that practice is not changed and achievement is not increased if there is no actionable response to these meetings taken by the teacher.

Results-oriented teacher collaboration teams embrace accountability. Two dimensions of accountability have been identified: 1) accountability to peers; and 2) accountability measures from the state and school district (Richmond & Manokore, 2011). The nature of professional learning community meetings involves consensus building, shared decision making, and actionable responses. While accountability measures from the state and district levels remain very clear, the sense of accountability for peers within a professional learning community also remains strong. Colleagues reinforce their agreed upon meeting norms, many of which are norms for participation (e.g., listening and responding to peers, sharing the floor, etc.) (Richmond & Manokore, 2011). In addition to those norms, teachers report back on their progress since the

development of co-constructed goals and strategies from previous PLCs. That adds accountability that supports actionable responses to instructional planning in their classrooms.

Saunders, Goldenberg, and Gallimore (2009) found that teams focused on specific academic needs and improving classroom learning and less on non-instructional issues achieved more significant growth in student achievement. The comparison schools in their study (which did not show significant improvement in achievement) focused more on shared or site-based governance than student learning. The study concluded that setting common goals and monitoring results can be encouraging and energizing as teachers recognize and celebrate accomplishments.

“The key is for teams of professionals to achieve and celebrate a continuous succession of small, quick victories in vital areas” (Schmoker, 2004, p. 3). Identifying and celebrating these quick wins supports commitment and long-term, collective momentum for a promising path to annual achievement gains (Schmoker, 2004). Valuing student achievement also means to celebrate it when it occurs (Eaker et al., 2002). In his book, *Good to Great*, Jim Collins (2001) pointed out that achievement never comes from a singular event, but rather, a cumulative process of successes that begin to slowly turn a giant, heavy flywheel. After some initial wins, the organization gets one very slow, squeaky turn of that proverbial flywheel. After celebrating many of those quick wins over time, that flywheel continues to turn faster and gain so much momentum that it would be hard to stop the huge, heavy disc from spinning (Collins, 2001). Whether in the education field or the world of business, leaders continue to recognize how frequently

celebrating short-term wins helps encourage colleagues to work interdependently for the common goals of the organization.

#### *Component 4: Working Interdependently*

Teacher collaboration teams open doors for teachers to see each other's practices, discuss what they are doing and why they are doing it that way, and begin to participate in new strategies learned from their teammates (Lave & Wenger, 1991; Wenger, 1998). In this way, they work interdependently, supporting and relying on each other in a manner that enables the participants to accomplish more as a group (DuFour, 2006). This level of interdependence requires that trust be built among teammates. Principals have identified trust as a strong facilitating feature for professional learning communities (Cranston, 2009). Faith, familiarity, and reliance upon each other enables teachers to work together in PLCs by discussing their situations and needs, helping each other with their problems, acting as sounding boards, and coaching each other (Jacobs & Yendol-Hoppey, 2010).

The discourse in the PLC meetings reported in many of the reviewed studies seems to go in and out of teacher stories of their experiences and general teaching principles tied to them. Horn & Little (2010) argued that this back-and-forth between the particular and the general provides clear opportunities of professional development and learning among the group. That practice of tying specific teaching principles to teacher accounts of practice not only generates the opportunity for professional learning, but it also can be the difference between productive meetings and complaint fests.

Another pattern of discourse includes much needed support between peers. These meetings involve teachers telling their peers about what could be perceived as their failures, and thus, they get much needed support and encouragement from their colleagues when transitioning to new strategies. These purposeful conversations focus on meeting the needs of students, and the teachers support each other in doing that (Strahan, 2003). In studies reviewed (Gates & Watkins, 2010; Richmond & Manokore, 2011; Strahan, 2003), these purposeful and supportive conversations cultivated an upward spiral of school improvement.

With a common purpose of increasing opportunities and achievement for their students, productive collaboration occurs in safe, supportive environments that are conducive to teachers sharing possible weaknesses with their peers and humbly helping each other seek and find the best practice for positive results. These safe environments are expected, and the studies report that PLC colleagues develop norms (also called “protocols”) to foster these understandings and agreements with each other (Gates & Watkins, 2010; Horn & Little, 2010; Mullen & Schunk, 2010; Richmond & Manokore, 2011; Strahan, 2003). Horn and Little (2010) found that teachers relieved one another from blame for problems of practice while also reinforcing that they were collectively responsible for student learning as well as professional development for each other. This further exhibits a steadfast culture of interdependence common in productive professional learning communities. Teachers in these collaborative professional cultures share a sense of professional togetherness, face difficult work with can-do attitudes, and help each

other with what could potentially be overwhelming laundry lists of tasks (Strahan, 2003). This professional togetherness is also a source of motivation and refreshment (Strahan, 2003).

Effective professional learning community discourse is supported by key factors such as advance organization provided by a facilitator; participation of all stakeholders with different roles; an intentional focus on shared leadership; group norming; respect for each other; and follow-up provided by the participants (Hoffman et al., 2009). School leaders can also prod this interdependent learning by providing feedback and asking guiding questions (Levine & Marcus, 2007). Such guidance from school leaders, along with frequently identifying quick wins, reinforces the trust found to be so necessary for teachers working interdependently. Teacher knowledge and capacity has been shown to have the most important influence on student achievement (Darling-Hammond, 1999). Therefore, helping them help each other is a major aspect of establishing a successful collaborative environment.

### *Teacher Collaboration and Student Achievement*

Studies reviewed on teacher collaboration and student achievement have reported promising results. “Thousands of schools and even entire districts can attest to the power of these structures for promoting first incremental and then cumulatively dramatic and enduring improvements in teaching and learning” (Schmoker, 2004, p. 8). Each of the studies reviewed used different measures of student achievement. None of them attempted to describe collaboration with specific, productive, and applicable descriptions of discourse as this dissertation has by defining the four key components of collaboration

and their relationship to student achievement. This study seeks to extend the current research by predicting student outcomes (as measured by scores from the Indiana Student Growth Model and “A-F” accountability ratings) from the key components of collaboration identified in the research.

Strahan (2003), examined the nature of the school culture at three elementary schools that beat the odds in improving school achievement. Each of the three schools had student populations that primarily consisted of students receiving free or reduced lunch, students of ethnic minorities, and large percentages of students who spoke languages other than English. These subgroups statistically do not score well on statewide achievement tests. However, these three schools functioned as professional learning communities and consistently showed growth in student achievement across six school years (from 1997 to 2002). Table 2.1 shows this data for each school. Strahan (2003) examined the data on percent passing the state standardized test. Data from a student growth model were not included.

Table 2.1

*Demographic and Achievement Data for Three Schools That Beat the Odds (1997-2002)*

	<b>Free and Reduced Lunch</b>	<b>Ethnic Minority</b>	<b>English Language Learners</b>	<b>% Mastery 1997</b>	<b>% Mastery 2002</b>
<b>Archer</b>	68%	70%	20%	49.4%	74%
<b>Hunter</b>	85%	91%	20%	44.6%	81.5%
<b>North</b>	70%	70%	Unknown	44.7%	71.5%



Additional research from Gates and Watkins (2010) describes two elementary schools identified as exemplary professional learning communities. Discovery Elementary and West Bend Elementary, both in Washington, had over 60% of their students eligible for free or reduced-price lunch and higher percentages of ethnic minorities. Like the aforementioned schools from North Carolina, these schools beat the statistical odds and showed great gains over an eight-year period from 2000-2007 (Gates & Watkins, 2010). Gates and Watkins (2010) examined the data on percent passing the state standardized test. Data from a student growth model were not included.

Zito (2011) conducted a study in a high performing school district (where approximately 95% of the students passed the state standardized test) and found no statistically significant relationship between teacher collaboration and student achievement. The study identified student achievement by looking at the passing rates of the state mandated standardized assessment and compared them to data collected from teacher surveys. Zito concluded that the study experienced the “ceiling effect,” whereas the students were already performing at such high levels that any team-level impact was not as visible due to there being less room to grow in the data. A significant relationship was noted between collaboration and changes in instructional practice, however (Zito, 2011). Zito surveyed 325 teachers from one school district and examined the data on percent passing the state standardized test. Data from a student growth model were not included.

In a study of teacher collaboration and its impact on learning, Rose (2008) noted that few studies actually directly relate collaborative teaching practices to measurable

student achievement. Studies reporting growth in student achievement include little about the structure of the collaboration (Rose, 2008). From a review of literature, Rose (2008) identified the following six key components of collaboration: 1) School Culture and School Climate; 2) Clear Goals; 3) Attention to Results; 4) Use of Time and Structures; 5) De-privatization; and 6) Reflective Dialogue about practice. This was a study of two high-performing elementary schools linking teacher perceptions of collaboration to student achievement. Both schools achieved significant gains in student performance. Rose surveyed 31 teachers and examined the data on percent passing the state standardized test. Data from a student growth model were also included in this study. Using a Pearson correlation analysis, significant negative correlations between perceptions of collaboration and student achievement were found. When perceptions of the value of collaboration were high, student achievement was low for the team or teacher. However, the study also showed that teams rated as having strong collaborators also yielded significantly higher student growth.

Reynolds (2008) conducted a case study of one middle school that exhibited increasing API (California's student growth model called "Academic Performance Index") scores and attributed its success to successful implementation of professional learning communities. Strong leadership from the principal, built-in collaboration time, a collective commitment to school improvement, and having established norms were among the characteristics cited as having an impact on the success of these PLCs (Reynolds, 2008). The following eight implications for PLC policy and practice were defined: 1) Embrace a common vision; 2) Empower leadership teams to take action and

innovate; 3) Creating a time for collaboration is essential; 4) Recognize that teachers may be reluctant to work in teams; 5) Achievement goals help guide staff toward a desired outcome; 6) Common assessments help guide a team in planning interventions; 7) Analyzing data and making instructional changes for student achievement is an ongoing process; and 8) Refine the process on an ongoing basis (Reynolds, 2008, pp. 128-133).

Gallozzi (2011) used data from the Colorado Student Assessment Program (i.e., student growth data from the model upon which the Indiana Student Growth Model was based) to analyze correlations between student achievement, and teachers' perceptions of collective efficacy and professional learning communities. The study revealed a significant positive correlation between collective efficacy and schools as professional learning communities. However, no significant correlation between collective efficacy and/or professional learning communities and student achievement was found, which was inconsistent with other studies the researcher had reviewed (Gallozzi, 2011). These inconsistent results were attributed to the limited number of teachers that could participate in the study, which included fourth and fifth grade teachers from one large school district in a suburban area of Denver, Colorado.

### *Conclusion*

In order to evaluate the impact of establishing PLCs, we need to pay attention to how PLCs have been studied as well as the ways collaborative conditions have been created (Joyce, 2004). Researchers and educational leaders can build upon the descriptions of conditions observed in productive professional learning communities to help guide practice that will support the use of this strategy. Although the research is

mixed, the literature suggests that schools functioning as productive professional learning communities may experience academic gains for their children.

Strahan (2003), examined the nature of the school culture at three elementary schools that beat the odds in improving school achievement. Each of the three schools functioned as professional learning communities and consistently showed growth in student achievement across six school years (from 1997 to 2002). Additional research from Gates and Watkins (2010) describes two elementary schools identified as exemplary professional learning communities. Like the aforementioned schools from Strahan's study, these schools beat the statistical odds and showed great gains over an eight-year period from 2000-2007 (Gates & Watkins, 2010). In a study of teacher collaboration and its impact on learning, Rose (2008) noted that few studies actually directly relate collaborative teaching practices to measureable student achievement. From a review of literature, Rose (2008) identified the following six key components of collaboration: 1) School Culture and School Climate; 2) Clear Goals; 3) Attention to Results; 4) Use of Time and Structures; 5) De-privatization; and 6) Reflective Dialogue about practice. This was a study of two high-performing elementary schools linking teacher perceptions of collaboration to student achievement. Both schools achieved significant gains in student performance. However, the results of the study were mixed. Using a Pearson correlation analysis, significant negative correlations between perceptions of collaboration and student achievement were found. When perceptions of the value of

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Four key components of teacher collaboration have emerged from this review of the literature, which include: 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently. These four elements provide a basis for clear understanding of the process and structure. Figure 2.2 on the next page displays each of these four components along with key phrases that help define them.

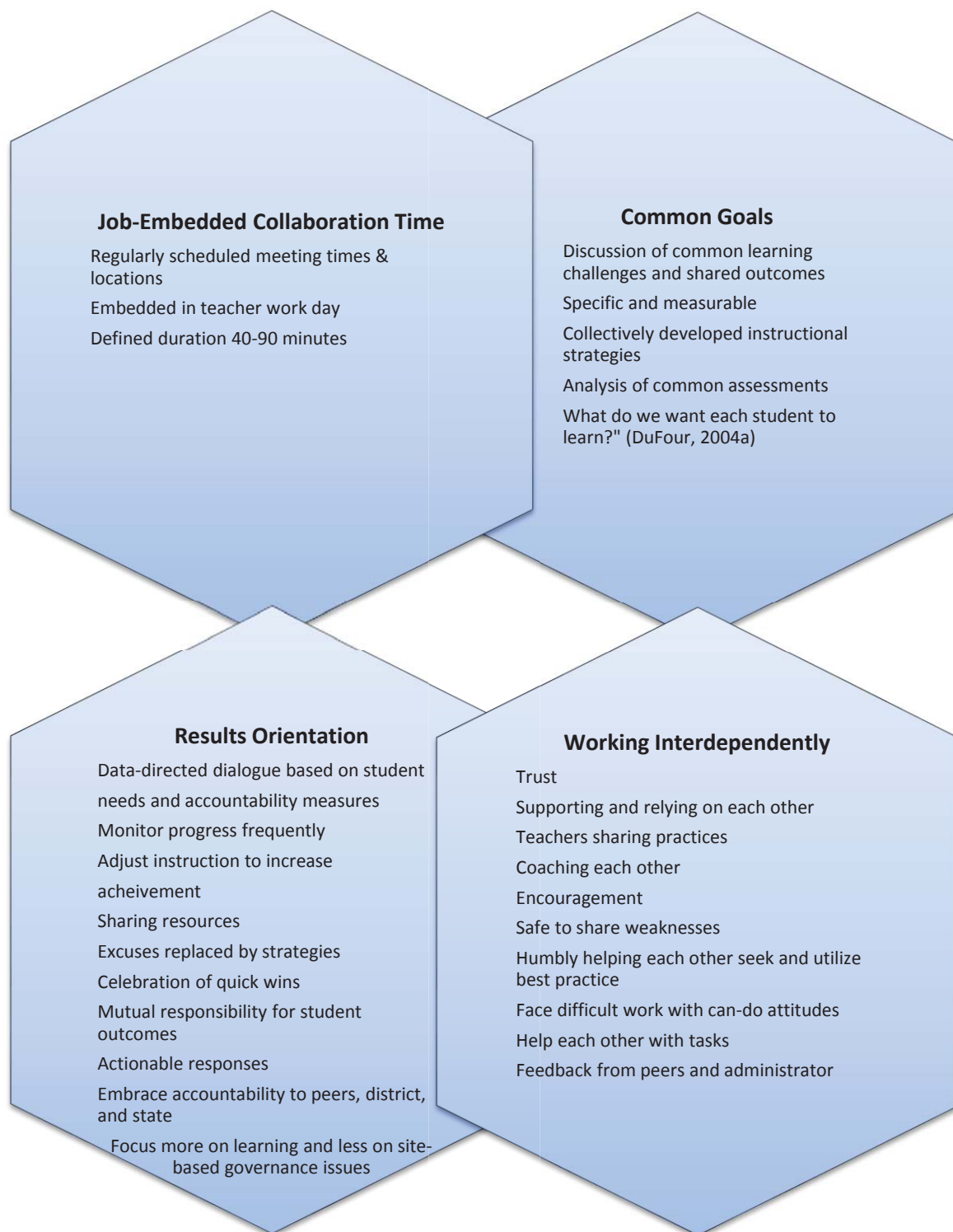


Figure 2.2

*The Four Key Components of Teacher Collaboration and Phrases that Help Define Them*

This study analyzed the relationship between principals' perceptions of these four key components of collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. Looking at passing rates only would suggest that high achieving schools are almost always more effective than low achieving schools (Betebenner, 2009). Studies have shown that children from low-income families enter school less prepared, and schools with higher percentages of these students typically have lower passing rates on state standardized tests than schools with more students from higher-income families. Growth models such as the Indiana Student Growth Model that use growth percentiles move analysis from not only looking at achievement but also effectiveness (Betebenner, 2006). The growth model takes into account that not all students start at the same academic level, and thus, they may not all reach a standardized target (passing) score in one year. It also considers other academic aspects, such as mobility as well as students who perform at the top and perceivably have less room to grow. While mobility of students (i.e., students moving from school-to-school) does not affect the way the Indiana Growth Model measures growth, the actual growth estimate displayed for a school or school corporation only includes students who attended the school or school corporation for 162 days or more of the school year being measured. Students scoring in the 99<sup>th</sup> percentile can theoretically still show growth the following year, since they will be categorized in an academic peer group accordingly (IDOE, 2009a).

The Indiana "A-F" Accountability Model calculates an "A-F" grade for an elementary or middle school using the schools ISTEP+ performance, ISTEP+ growth

measured from the Indiana Student Growth Model, and ISTEP+ participation rates (IDOE, 2013). It is a comprehensive, standardized model that measures student achievement not just on meeting or exceeding a standard score, but it also measures effectiveness of one year of instruction.

The Indiana “A-F” Accountability Model also enabled this study to analyze the relationship between collaboration and student achievement on a wider scale than studies reviewed have typically taken. While most of the studies identified a total of 1 to 3 schools or one school district, this dissertation analyzed elementary and middle schools across the State of Indiana according to their “A-F” scores. Further details on the Indiana Student Growth Model and the Indiana “A-F” Accountability Model have been included in chapter 3.

The push for education reform has continued to build since the space race in the 1960’s, the publication and attention of *A Nation at Risk* in the 1980’s, and the “flattening” of the world in the 1990’s and current millennium. Blogs reveal signs of the professional learning community model in other continents across our globe. This study investigated the relationship between principal perceptions of teacher collaboration and student achievement while developing an evaluative tool for principals to determine the presence and effectiveness of key components of collaboration in their schools.

School leaders need manageable, precise plans of action to begin the important work of making productive teacher collaboration a part of their ongoing culture. They need an understanding of the most effective components of teacher collaboration. Ultimately, school leaders need an instrument to help them assess the presence of these



components in their schools. This study has developed that much needed instrument that school leaders and researchers can use to measure the presence of key components of collaboration in a school and how they relate to student achievement. Such an instrument can help measure the effectiveness and presence of collaboration components for a school, and as a result, provide a focus for professional development.

## CHAPTER 3

### METHODOLOGY

This concurrent embedded mixed-methods study developed an instrument to measure principals' perceptions of teacher collaboration in their schools. The study further examined the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana "A-F" Accountability Model.

Four key components of teacher collaboration were identified from a review of literature. A survey was developed and used to measure principals' perceptions of the presence and effectiveness of these four key components in their schools. Ratings from the survey were analyzed with each school's score on the Indiana "A-F" Accountability Model. This survey collected quantitative data using a Likert-like scale to measure principals' perceptions of the presence and effectiveness of the identified key components of collaboration in the schools they serve. Open-ended questions were also included in the survey, resulting in a mixed methods study that collected both quantitative and qualitative data. The primary method of data collection was quantitative, with the qualitative data collection embedded in the approach to play a supportive role. The reason for collecting qualitative data from the open-ended survey questions was to more fully understand principal perceptions of collaboration, particularly as it related to student achievement.

### *Student Achievement*

In order to understand the outcome variables that were used in the study, it is valuable to examine the methods of determining academic growth and school success that are currently endorsed by the Indiana Department of Education. Two measurements of student achievement in Indiana include the Indian Student Growth Model and the Indiana “A-F” Accountability Model. Both models measure student achievement on Indiana’s state-wide standardized test, Indiana Statewide Testing for Educational Progress-Plus (ISTEP+). The Indiana Student Growth Model measures annual student growth, while the Indiana “A-F” Accountability Model combines the Indiana Student Growth Model data with overall performance and participation rates.

“Indiana’s Growth Model has set a national standard for measuring the academic progress students make during a school year” (IDOE, 2012a, para. 1). The model reviews growth in student achievement, not just whether a student passes or fails a test (IDOE, 2012b). Indiana’s Growth Model was based upon the Colorado Growth Model, which uses the Student Growth Percentile method to compare individual students to those who begin at similar levels of achievement and analyze their growth over time (IDOE, 2009b). More specifically, it is a statistical way to determine how much of a change in ISTEP+ scores equals a year of growth for students (IDOE, 2009a). Using student growth percentiles in such growth models help educators with a quantification of how much a student grew and provides a gauge of whether or not it was enough growth for the school year (Betebenner, 2006).

The Indiana Growth Model starts with a student's ISTEP+ score in the first year of analysis and groups it with all other students who got the same score that year for that subject (i.e., English/Language Arts or Math). Then, the second year scores of all students in that group are compared to see how they scored in comparison to each other, representing a percentile measurement of how each student grew in that year in relation to the other students in the state who were from the same statistical group. The students in this academic peer group are classified into three categories: 1) "High Growth" is from the 66<sup>th</sup> to 99<sup>th</sup> percentile; 2) "Typical Growth" is from the 35<sup>th</sup> to 65<sup>th</sup> percentile; and 3) "Low Growth" is from the 1<sup>st</sup> to the 34<sup>th</sup> percentile (IDOE, 2009a).

Looking at passing rates only would suggest that high achieving schools are almost always more effective than low achieving schools (Betebenner, 2009). An analysis in 2010 and 2011 revealed that in the United States, the average low-income student attends a school that scores in the 42<sup>nd</sup> percentile on state exams, and the average middle and high income student attends a school that scores in the 61<sup>st</sup> percentile (Rothwell, 2012). In his State of the Union address on February 12, 2013, President Obama stated (para. 7), "A zip code should never predetermine the quality of any child's educational opportunities. Yet studies show that children from low-income families are less likely to have access to high-quality early education and less likely to enter school prepared for success"(Obama, 2013). Growth models such as the Indiana Student Growth Model that use growth percentiles move analysis from not only looking at achievement but also effectiveness (Betebenner, 2006). The growth model takes into account that not all students start at the same academic level, and thus, they may not all

reach a standardized target (passing) score in one year. It also considers other academic aspects, such as mobility as well as students who perform at the top and perceivably have less room to grow. While mobility of students (i.e., students moving from school-to-school) does not affect the way the Indiana Growth Model measures growth, the actual growth estimate displayed for a school or school corporation only includes students who attended the school or school corporation for 162 days or more of the school year being measured. Students scoring in the 99<sup>th</sup> percentile can theoretically still show growth the following year, since they will be categorized in an academic peer group accordingly (IDOE, 2009a).

The Indiana Growth Model shows academic growth for each student in a year and also offers the data for each school's growth score depending upon how many students of that school make high or low growth on the ISTEP+ test. Growth for a whole school is measured by calculating the percentage of students at "High Growth" and "Low Growth" for the whole school (IDOE, 2012a). A student must have an ISTEP+ score from the previous year in order to have a second score to compare.

The Indiana "A-F" Accountability Model calculates an "A-F" grade for an elementary or middle school using the schools ISTEP+ performance, ISTEP+ growth measured from the Indiana Student Growth Model, and ISTEP+ participation rates (IDOE, 2013). First, schools receive their initial English/Language Arts and Math scores resulting in the percentage of students passing those subjects on ISTEP+, Indiana Modified Achievement Standards Test (IMAST) (an alternative assessment to ISTEP+ that some special education students take), and Indiana Standards Tool for Alternate

Reporting (ISTAR) (an alternative assessment for students who perform significantly below grade level and may have personal learning goals that cannot be measured on a standardized test like ISTEP+ or IMAST). Only students who were enrolled at the school for 162 days or more are included in these initial passing percentages. Also, English Language Learners who have been in the United States for less than 12 months are exempt from these percentages. The initial scores for English/Language Arts and Math are calculated on a four-point scale as shown in Table 3.1.

Table 3.1

*ISTEP+/IMAST/ISTAR Percentage Passing Converted to “A-F” 4-Point Performance Scale*

<b>English/Language Arts</b>		<b>Math</b>	
<b>90.0-100.0%</b>	4.0 Points	<b>90.0-100.0%</b>	4.0 Points
<b>85.0-89.9%</b>	3.5 Points	<b>85.0-89.9%</b>	3.5 Points
<b>80.0-84.9%</b>	3.0 Points	<b>80.0-84.9%</b>	3.0 Points
<b>75.0-79.9%</b>	2.5 Points	<b>75.0-79.9%</b>	2.5 Points
<b>70-74.9%</b>	2.0 Points	<b>70-74.9%</b>	2.0 Points
<b>65.0-69.9%</b>	1.5 Points	<b>65.0-69.9%</b>	1.5 Points
<b>60.0-64.9%</b>	1.0 Points	<b>60.0-64.9%</b>	1.0 Points
<b>0.00-59.9%</b>	0.0 Points	<b>0.00-59.9%</b>	0.0 Points

Next, the “A-F” performance score for a school that has been calculated using the information in Table 3.1 can be raised or lowered based on student academic growth as measured by the Indiana Student Growth Model. The initial performance score can be raised if a significant percentage of the lowest performing students on ISTEP+ (the bottom 25%) show high growth. For English/Language Arts, 42.5% has been identified as the target for reaching a “significant” percentage of the lowest performing students on

ISTEP+, and 44.9% has been identified as that target for Math. The overall school score can be raised by 1.0 point in English Language Arts if 42.5% of the students in the bottom 25% of ISTEP+ performance met their individual “High Growth” targets.

Likewise, the overall school score can be raised by 1.0 point in Math if 44.5% of the students in the bottom 25% of ISTEP+ performance met their individual “High Growth” targets (IDOE, 2013).

The overall school score may also be raised if a significant percentage of the remaining students, those scoring in the top 75% of ISTEP+ performance, reach their “High Growth” targets. The overall school score can be raised by 1.0 point in English Language Arts if 36.2% of the students in the top 75% of ISTEP+ performance met their individual “High Growth” targets. Likewise, the overall school score can be raised by 1.0 point in Math if 39.2% of the students in the top 75% of ISTEP+ performance met their individual “High Growth” targets. In total, two additional points are possible for student growth in English/Language Arts (i.e., one point for the bottom 25% and one point for the top 75%), and two additional points are possible for student growth in Math (i.e., one point for the bottom 25% and one point for the top 75%) (IDOE, 2013).

The overall school score can be lowered if a significant percentage of all students in the school show “Low Growth,” as measured by the Indiana Growth Model. The overall school score can be lowered by 1.0 point in English Language Arts if 39.8% of the students in the whole school exhibit ISTEP+ performance at or below their individual “Low Growth” targets. Likewise, the overall school score can be lowered by 1.0 point in

Math if 42.4% of the students in the whole school exhibit ISTEP+ performance at or below their individual “Low Growth” targets (IDOE, 2013).

The third and final aspect that impacts the overall “A-F” accountability score for a school is participation. If less than 95% of the students of the students in the bottom 25% of ISTEP+ performance actually participate in ISTEP+/IMAST/ISTAR English/Language Arts, the initial “A-F” accountability score may also be lowered 1 point in English Language Arts. If less than 95% of the students of the students in the bottom 25% of ISTEP+ performance actually participate in ISTEP+/IMAST/ISTAR Math, the initial “A-F” accountability score may also be lowered 1 point in Math. If less than 95% of the students of the students scoring in the top 75% of ISTEP+ performance actually participate in ISTEP+/IMAST/ISTAR English/Language Arts, the initial “A-F” accountability score may also be lowered 1 point in English/Language Arts. If less than 95% of the students of the students scoring in the top 75% of ISTEP+ performance actually participate in ISTEP+/IMAST/ISTAR Math, the initial “A-F” accountability score may also be lowered 1 point in Math (IDOE, 2013). Figure 3.1 on the next page offers a summary of the implications of student growth on the overall “A-F” school accountability score.



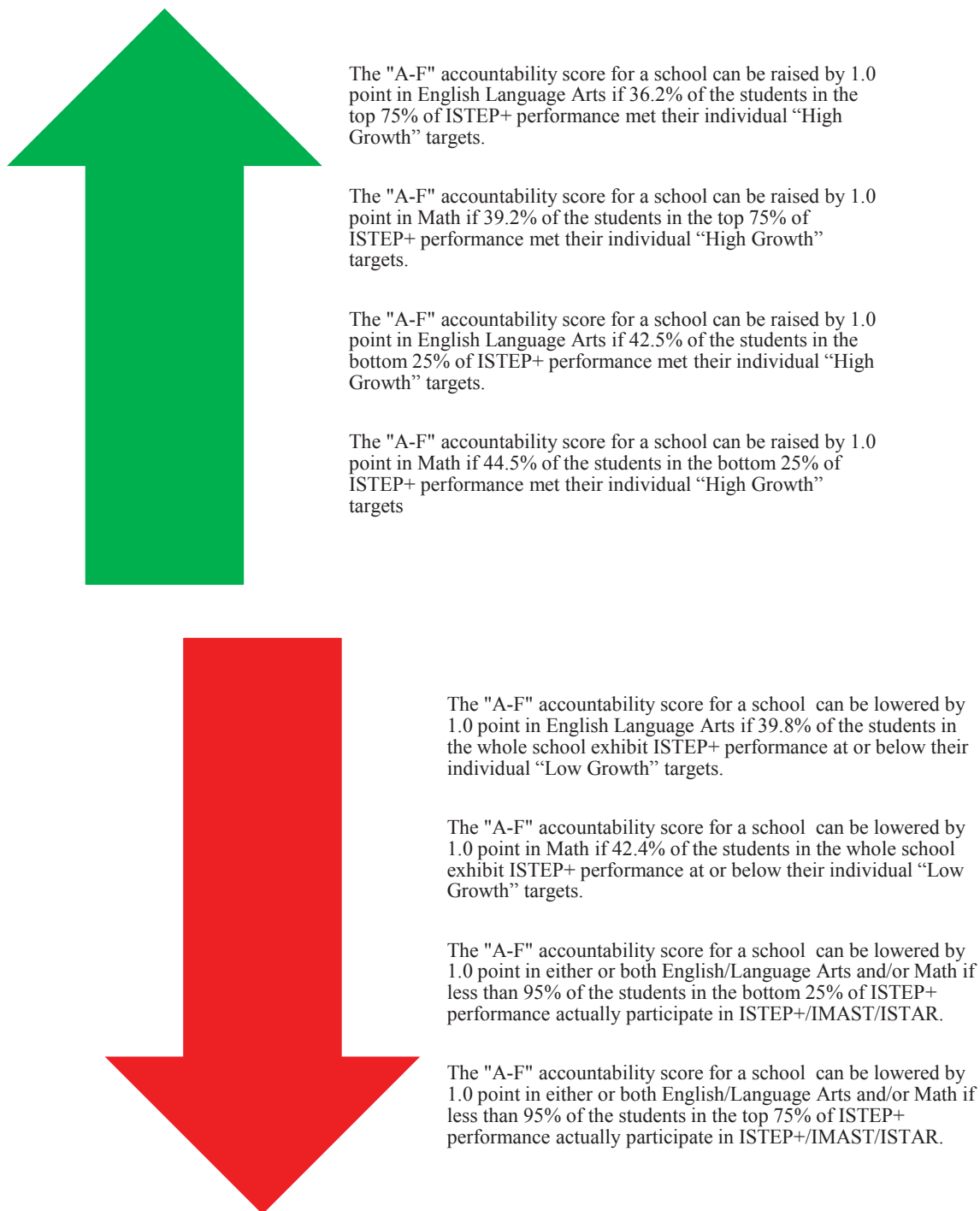


Figure 3.1

*Summary of the Implications of Student Growth on the Overall "A-F" School  
Accountability Score*

The three aforementioned components (i.e., the performance score, the growth score, and the participation score) are calculated to determine a final score for English/Language Arts and a separate final score for Math. These scores are matched with a letter grade as shown in Table 3.2. A final score and letter grade is determined for the school by adding the English/Language Arts score and the Math score and then dividing by two. The final letter grade is matched to the final point value as shown in Table 3.2.

Table 3.2

*“A-F” Accountability Points and Letter Grade Scale*

<b>Final Letter Grade</b>	
<b>3.51 – 4.00</b>	<b>A</b>
<b>3.00 – 3.50</b>	<b>B</b>
<b>2.00 – 2.99</b>	<b>C</b>
<b>1.00 – 1.99</b>	<b>D</b>
<b>0.00 – 0.99</b>	<b>F</b>

This study utilized the data provided by the Indiana “A-F” School Accountability Model as the dependent variable, because it offers a standardized, combined measurement of student performance, student growth, and student participation.

### *Research Questions and Hypotheses*

This mixed methods study of the relationship between key components of teacher collaboration and student achievement collected both quantitative and qualitative data. The primary method of data collection was quantitative, with the qualitative data collection embedded in the approach to play a supportive role in providing further perspective in analysis. The initial research question that has been answered through a review of literature is as follows:

- 1) What are the most important components of teacher collaboration?

Four key components of teacher collaboration were identified through the review of literature and further defined in Chapter Two. The four key components of teacher collaboration include: 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently. These four key components have been included in the hypotheses that were tested to help answer the following critical research questions that were answered through quantitative procedures:

- 1) What key components of teacher collaboration do principals see most often in their schools?
- 2) How does the presence and effectiveness of these components in collaboration among elementary teacher teams relate to student achievement?

As a result of the literature review regarding the key components of teacher collaboration, the following hypotheses were tested to provide information regarding the presence of the components as asked in the two aforementioned quantitative questions:

HO<sub>1</sub>: There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>2</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>3</sub>: There is no statistically significant relationship between principal ratings on the presence teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>4</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.

To provide information regarding the effectiveness of the components as asked in the two aforementioned quantitative research questions, an exploratory factor analysis approach was used to create the following three hypotheses:

HO<sub>5</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>6</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>7</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.

The exploratory factor analysis enabled the researcher to find meaningful patterns within the effectiveness variables, simplify the data, and ultimately run a more meaningful multiple regression analysis. The researcher found the effectiveness variables within a large data set that related most closely with each other and might have been measuring the same thing. That “thing” became a factor, and in this study, three factors emerged. Each factor represented the combination of those overlapping effectiveness variables into a single index that measured that construct. This study found three ways of combining the effectiveness items from the survey to measure specific constructs. The three factors were identified as “Developing and Monitoring Specific Goals,” “Trusting, Supportive Collegiality,” and “Sharing Resources and Practices” and were tested in the three different hypotheses.

The following critical research questions were answered through qualitative procedures:

- 1) How do principals describe the collaboration process in their schools?
- 2) What do principals describe as the factors that impede effective collaboration in their schools?
- 3) What do principals describe as the factors that facilitate effective collaboration in their schools?

- 4) What relationship do principals perceive exists between the quality/extent of collaboration and student achievement?

Finally, the following mixed-methods research question integrated and extended the quantitative and qualitative results of the study:

- 1) To what extent do themes generated from responses to the open-ended questions help inform the measured relationship between principal perceptions of teacher collaboration in their schools and student achievement?

### *Participants and Settings*

The population for this study included the principals of 1,366 traditional public (non-charter) elementary and middle schools in the State of Indiana. These were the traditional public (non-charter) elementary and middle schools that received Indiana “A-F” Accountability grades for all three school years including 2010, 2011, and 2012. The schools were identified using data from a spreadsheet the Indiana Department of Education released to the media and also posted on the department website. All 1,366 principals of these schools had an equal opportunity to respond to the survey, and 359 participated. It should be noted that 1,367 schools were initially identified for this study, but the principal of one of those schools was also the researcher and author of this study and therefore was not included.

Each of the schools in the population had been open for at least four years. Schools on the elementary and middle schools list served any and all grades between 3<sup>rd</sup> grade and 8<sup>th</sup> grade. “Combined schools” were considered schools that serve any and all

grades between 3<sup>rd</sup> and 8<sup>th</sup> grade as well as all grades between 10<sup>th</sup> and 12<sup>th</sup> grade during the school year being assessed. Combined schools were not included in this study.

### *Instrument Development*

A survey instrument was developed to measure the four key components of collaboration based on essential elements identified in the literature. The survey included three sections. Section I gathered principals' background information, including the school they served and how long they had been in their current position. The information regarding what school each principal served was used to match their survey responses to their Indiana "A-F" Accountability Model results. Once initial matching of schools and principals was accomplished, identifying information was removed from the dataset and each principal-school pair was assigned a code. Section II gathered principals' ratings on the presence and effectiveness of the key components of teacher collaboration. The first key collaboration component was job-embedded collaboration time. The items for this component included two "Yes" or "No" questions measured on a 2-point categorical scale, two questions that measured the amount of job-embedded time that were each on a 6-point continuous scale, and one question about the effectiveness of the collaboration component measured on a 4-point continuous scale. Section II also gathered principals' ratings on the presence and effectiveness of the remaining key components of collaboration, including common goals, results orientation, and working interdependently. Each criterion of the collaboration component was described in the middle column of the survey, with the presence being measured on a 2-point categorical scale (i.e., 1) Yes; and 2) No) on the left of the described criterion and the effectiveness

being measured on a 4-point continuous scale (i.e., 1) Highly Effective; 2) Effective; 3) Improvement Necessary; and 4) Ineffective) on the right of each described criterion.

Table 3.3 displays an example of one of the survey items in Section II of the instrument that was developed. The whole survey instrument as it appeared through Qualtrics survey software can be seen in Appendix A.

Table 3.3

*Example of Survey Item in Section II*

Collaboration Component 2: Common Goals								
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?					
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)	
Yes	No	8) discuss common learning challenges for their students.	HE	E	IN	IE	NA	

Finally, Section III included open-ended questions which gathered qualitative data from the principals. These open-ended questions of the survey resulted in a concurrent embedded mixed-methods study in which quantitative and qualitative data were collected at the same time. This method enabled the researcher to gain broader perspectives than just using the quantitative (predominant method) alone (Creswell, 2013).



All survey items were designed by the researcher and analyzed for content and clarity by a panel of reviewers with experience in educational leadership and survey development. This review and analysis was important for improving the questions, format, scales, and validity of the instrument. Revisions were made based on feedback from the panel. In addition, Cronbach's alpha was used to gauge reliability of each subscale and item. Total correlations were evaluated to determine the contribution of each of the four constructs being measured by the instrument. Additional revisions to the instrument were made on the basis of this empirical data.

### *Research Design*

The purpose of this concurrent embedded mixed-methods study was to develop an instrument to measure principals' perceptions of teacher collaboration in their schools and further examine the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. The instrument of the study primarily collected quantitative data with an embedded qualitative component collected through open-ended survey questions to play a supportive role. This mixed methods approach enabled the researcher to gain broader perspectives than just using the quantitative (predominant method) alone (Creswell, 2013). The survey method was utilized to develop a quantitative description of principals' perceptions of the presence and effectiveness of the four key components of collaboration in their schools while also gaining broader, qualitative descriptions.

The independent variables of the study were the four key components of teacher collaboration, and the dependent variable was student achievement as measured by the

Indiana “A-F” Accountability Model. The relationship between the independent and dependent variables were examined through multiple regression analysis to discover predictive relationships between the four key components of teacher collaboration and student achievement as measured by the Indiana “A-F” Accountability model.

The descriptive analyses of the independent variables for the study displayed very little variability within the data on the presence of the key components of collaboration, while more variability in the data on the effectiveness of the components was noted. Therefore, hypotheses were tested through a multiple regression analysis for the presence of each of the four key components, while a factor analysis was used to identify factors among the effectiveness ratings of the key components, test hypotheses related to those factors, and ultimately run a more meaningful multiple regression analysis on the perceived effectiveness of collaboration.

Hermeneutics served as the theoretical framework for the qualitative portion of the study. Patton (2002) listed the foundational question for hermeneutics as, “What are the conditions under which a human act took place or a product was produced that make it possible to interpret its meanings?” (p. 113). Hermeneutics provides a theoretical framework for interpreting and providing meaning for what people do (Patton, 2002). In this study, four key components of collaboration were identified through a review of literature, and ratings of principal perceptions of the presence and effectiveness of these components were collected. The open-ended questions of the survey allowed the researcher to further interpret and make meaning of these findings.

Grounded theory was used as the method of analysis for the qualitative data. Grounded theory provides systematic and rigorous procedures for generating theory with raw qualitative data (Patton, 2002). This approach involved reading through the open ended responses (qualitative data) and coding or classifying significant patterns that emerged. The meanings of these patterns or categories were then interpreted, which became the basis for assertions made from the qualitative data.

### *Procedures*

Upon approval from the Institutional Review Board, the survey was administered using Qualtrics to principals of 1,366 traditional public (non-charter) elementary and middle schools across the State of Indiana. Qualtrics is a web-based survey software. The researcher introduced himself and the study to the participants through an email that contained a link to the survey. Principals were asked to identify their schools on the survey for the purpose of matching their responses to their Indiana “A-F” Accountability Model data, but anonymity and confidentiality were maintained in the study. The survey was cross-sectional, in that it collected the primary quantitative data through closed-ended ratings and the secondary qualitative data through open-ended questions all at the same point in time.

### *Data Analysis Procedures*

Quantitative data were analyzed using a multiple regression analysis in SPSS. The principal ratings were the predictors (independent variables) with student achievement as measured by the Indiana “A-F” Accountability Model as the outcome

(dependent variable). Descriptive statistics, including the mean and standard deviation of all components combined as well as each of the four separate subscales were analyzed. Internal consistency and reliability were assessed using coefficient alpha for all components as well as each of the four subscales separately. Correlations for each of the four subscales and all components combined were also analyzed. Items with low correlations with the construct being measured by the subscales were eliminated from the scale.

In order to calculate ratings for each of the components, the ratings for each respondent and each item were entered in SPSS. Since only four items measured the presence of the first component, Job-Embedded Collaboration Time, each of those ratings were used in the multiple regression analysis, while an average rating for each of the remaining three key components of collaboration was calculated for presence as rated by the principals. Those three components were measured with considerably more items on the survey, and thus a total averaged score was used to represent them in the multiple regression analysis. For example, each respondent had an average rating for Common Goals/Presence, Results Orientation/Presence, and Working Interdependently/Presence, while all four ratings for each respondent on Job-Embedded Collaboration Time was used in the multiple regression analysis. Next, an exploratory factor analysis was run for the effectiveness ratings of the key components of collaboration. Three factors were identified, and SPSS calculated factor scores for each of those three factors based on the ratings of each participant. These ratings (both the average ratings for the presence and

the three factor scores for the effectiveness) were used in the regression analyses as predictors of “A-F” ratings to test each of the hypotheses through a multiple regression analysis.

Finally, a multiple regression analysis with all three effectiveness factors combined as the predictors and student achievement as the outcome was run. This helped the researcher determine which component contributed the most and which component contributed the least to the outcome variable by examining the respective beta weights.

Using hermeneutics as the theoretical framework for the qualitative portion of the study, the researcher interpreted and provided further meaning to the study by applying grounded theory as a method of analysis of the data collected through the open-ended questions of the survey. The researcher made several passes through the open ended responses (qualitative data), coding significant patterns that emerged. The meanings of these codes were then interpreted and became the basis for assertions made from the qualitative data.

Lastly, to answer the mixed-methods question regarding the extent to which qualitative themes help explain the measured relationship between principal perceptions of teacher collaboration and student achievement, qualitative and quantitative findings were analyzed, side by side. Consistencies and inconsistencies in the data were explored to reveal a deeper understanding of the phenomena of teacher collaboration and student learning.

## CHAPTER 4

### RESULTS

This chapter reports the results and analysis for both the quantitative and qualitative portions of the study. This study identified four key components of teacher collaboration from a review of literature and developed an instrument to measure principals' perceptions of those components of teacher collaboration in their schools. The study further examined the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. The quantitative results are first reported according to how they relate to the research questions. The qualitative results are then reported in a similar manner, followed by an analysis of the research questions.

The main purpose of this concurrent embedded mixed-methods study was to develop an instrument to measure principals' perceptions of teacher collaboration in their schools. Cronbach's Alpha was used to test the internal consistency of that instrument. Table 4.1 on the next page displays the Cronbach's alpha results for each of the four components as well as the whole scale combined.

Table 4.1

*Cronbach's Alpha*

Key Component of Teacher Collaboration	Number of Items	Cronbach's Alpha
Presence and Effectiveness of Job –Embedded Collaboration Time	5	.640
Presence and Effectiveness of Common Goals	10	.787
Presence and Effectiveness of Results Orientation	20	.868
Presence and Effectiveness of Working Interdependently	16	.853
Whole Scale Combined	51	.924

Cronbach's alpha results show the items measured for the presence and effectiveness of job-embedded collaboration time at  $\alpha = .640$ , the only component that is less than  $\alpha = .700$ . This component also has a significantly lower number of items (5), which may have contributed to that item being lower than the others. Each of the other three key components of collaboration as well as the whole scale combined were above  $\alpha = .700$ . Nunnally (1967) asserted that a Cronbach's alpha of  $0.80 \leq \alpha < 1.00$  is highly reliable, and George and Mallery (2003) more recently explained that  $0.70 \leq \alpha < 0.80$  is Acceptable,  $0.80 \leq \alpha < 0.90$  is Good, and  $\alpha \geq 0.90$  is Excellent. Therefore, the data suggested that the instrument created in this study is a reliable and valid measurement tool at  $\alpha = .924$ .

*Quantitative Results on the Presence of the Key Components of Teacher Collaboration*

The initial research question that was answered through a review of literature was, “What are the most important components of teacher collaboration?” As outlined in chapter 2, four key components were identified, including: Component 1: Job-Embedded Collaboration Time; Component 2: Common Goals; Component 3: Results Orientation; and Component 4: Working Interdependently. These four key components were included in the hypotheses that were tested and answered through quantitative procedures.

The next research questions for the study were, “What key components of teacher collaboration do principals see most often in their schools?” and, “How does the presence and effectiveness of these components in collaboration among elementary teacher teams relate to student achievement?” The results related to these questions are first reported by presence of the components and followed by their effectiveness. Table 4.2 on the next page lists the items from the survey that measured the presence of the first component, Job-Embedded Collaboration Time.



Table 4.2

*Survey Items That Measured the Presence of Component 1, Job-Embedded Collaboration Time*

<b>Collaboration Component</b>	<b>Survey Item</b>
<b>Job-Embedded Collaboration Time</b>	Do teachers at your school have regularly scheduled collaboration times?
<b>Job-Embedded Collaboration Time</b>	Do teachers at your school have regularly specified meeting locations?
<b>Job-Embedded Collaboration Time</b>	About how many minutes each week do teachers at your school collaborate during a structured meeting time?
<b>Job-Embedded Collaboration Time</b>	About how many minutes each month do teachers at your school collaborate during a structured meeting time?

Table 4.3 follows on the next page with the descriptive statistics for the first component, Job-Embedded Collaboration Time.

Table 4.3

*Descriptive Statistics of the Presence of Component 1, Job-Embedded Collaboration**Time*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Frequency</b>	<b>Percent</b>
<b>Regularly Scheduled Collaboration Times</b>	358	1.94	0.23	No = 20	No = 5.6
				Yes = 338	Yes = 94.4
<b>Regularly Specified Meeting Locations</b>	358	1.84	0.37	No = 58	No = 16.2
				Yes = 300	Yes = 83.8
<b>Minutes Each Week</b>	357	4.16	1.65	1 = 32	1 = 9
				2 = 22	2 = 6.2
				3 = 82	3 = 23
				4 = 61	4 = 17.1
				5 = 40	5 = 11.2
				6 = 120	6 = 33.6
<b>Minutes Each Month</b>	356	4.99	1.38	1 = 8	1 = 2.2
				2 = 23	2 = 6.5
				3 = 27	3 = 7.6
				4 = 39	4 = 11
				5 = 66	5 = 18.5
				6 = 193	6 = 54.2

Note:

N = Number of principals in the sample

(continued)

Table 4.3 (continued)

*Descriptive Statistics of the Presence of Component 1, Job-Embedded Collaboration**Time*

**Mean** = Average of the principals' ratings of the component; Regularly Scheduled Collaboration Times and Regularly Specified Meeting Locations were on a 2 point scale with 1 meaning "No" and 2 meaning "Yes," while Minutes Each Week and Minutes Each Month were on a 6 point scale with 6 being the largest quantity of time and 1 being the lowest; Exact quantities of time for each of the point values can be found in the answer choices to the questions located in Section II of the instrument which has been included in Appendix A

**Std. Deviation** = Standard Deviation, how much the data varies from the mean

**Frequency** = Number of times a "Yes" or "No" rating was selected

**Percent** = Percentage of "Yes" or "No" ratings

Table 4.3 shows little variability in the data on the presence of the first component, Job-Embedded Collaboration Time. In fact, 94.4% of the principals said their schools had regularly scheduled collaboration times, and 83.8% of the principals said their schools had regularly specified meeting locations. There is more variability in the number of minutes each week and each month, but very few principals reported duration of collaboration times to be less than what was defined in the literature as reviewed in chapter 2.

Table 4.4 lists the items from the survey that measured the presence of the second component, Common Goals, and Table 4.5 follows on the next page with the descriptive statistics for that component.

Table 4.4

*Survey Items That Measured the Presence of Component 2, Common Goals*

<b>Collaboration Component</b>	<b>Survey Item</b>
	<i>Teacher teams/grade levels at your school:</i>
<b>Common Goals</b>	Discuss common learning challenges for their students.
<b>Common Goals</b>	Discuss shared outcomes for what they want their students to learn.
<b>Common Goals</b>	Develop specific and measureable goals for student achievement.
<b>Common Goals</b>	Collectively develop instructional strategies.
<b>Common Goals</b>	Collectively analyze common assessments.

Table 4.5

*Descriptive Statistics of the Presence of Component 2, Common Goals*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Frequency</b>	<b>Percent</b>
<b>Discuss Common Learning Challenges</b>	345	1.98	0.14	No = 7	No = 2
				Yes = 338	Yes = 98
<b>Discuss Shared Outcomes</b>	346	1.96	0.20	No = 14	No = 4
				Yes = 332	Yes = 96
<b>Develop Specific and Measurable Student Achievement Goals</b>	345	1.91	0.28	No = 30	No = 8.7
				Yes = 315	Yes = 91.3
<b>Collectively Develop Instructional strategies</b>	344	1.94	0.25	No = 22	No = 6.4
				Yes = 322	Yes = 93.6
<b>Collectively Analyze Common Assessments</b>	345	1.91	0.29	No = 31	No = 9
				Yes = 314	Yes = 91

Note:

**N** = Number of principals in the sample

**Mean** = Average of the principals' ratings of the component

**Std. Deviation** = Standard Deviation, how much the data varies from the mean

**Frequency** = Number of times a "Yes" or "No" rating was selected

**Percent** = Percentage of "Yes" or "No" ratings

Table 4.5 shows little variability in the data on the presence of the second component, Common Goals. In fact, 98% of the principals said their teacher teams/grade levels discuss common learning challenges, 96% said their teacher teams/grade levels

discuss shared outcomes, 91.3% said their teacher teams/grade levels develop specific and measurable student achievement goals, 93.6% said their teacher teams/grade levels collectively develop instructional strategies, and 91% of the principals said their teacher teams/grade levels collectively analyze common assessments.

Table 4.6 lists the items from the survey that measured the presence of the third component, Results Orientation, and Table 4.7 follows with the descriptive statistics for that component.

Table 4.6

*Survey Items That Measured the Presence of Component 3, Results Orientation*

<b>Collaboration Component</b>	<b>Survey Item</b>
	<i>Teacher teams/grade levels at your school:</i>
<b>Results Orientation</b>	Have discussions based on student needs and accountability measures (i.e., data-directed dialogue).
<b>Results Orientation</b>	Monitor student progress with learning evidence or data.
<b>Results Orientation</b>	Develop specific and measurable goals for student achievement.
<b>Results Orientation</b>	Adjust their instruction to increase achievement as a result of their collaboration.
<b>Results Orientation</b>	Share instructional resources.
<b>Results Orientation</b>	Frequently celebration progress made by their team and/or students.

(continued)

Table 4.6 (continued)

*Survey Items That Measured the Presence of Component 3, Results Orientation*

<b>Collaboration Component</b>	<b>Survey Item</b>
	<i>Teacher teams/grade levels at your school:</i>
<b>Results Orientation</b>	Make actionable responses based on their collaboration.
<b>Results Orientation</b>	Are accountable to their teammates.
<b>Results Orientation</b>	Embrace district and state accountability.
<b>Results Orientation</b>	Focus more on learning and less on site-based governance issues.

Table 4.7

*Descriptive Statistics of the Presence of Component 3, Results Orientation*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Frequency</b>	<b>Percent</b>
<b>Discussions Based on Student Needs and Accountability Measures</b>	348	1.97	0.17	No = 10 Yes = 338	No = 2.8 Yes = 97.1
<b>Monitor Student Progress</b>	347	1.99	0.12	No = 5 Yes = 342	No = 1.4 Yes = 98.6
<b>Develop Specific and Measurable Student Achievement Goals</b>	348	1.92	0.28	No = 29 Yes = 319	No = 8.3 Yes = 91.7

(continued)

Table 4.7 (continued)

*Descriptive Statistics of the Presence of Component 3, Results Orientation*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Frequency</b>	<b>Percent</b>
<b>Adjust Instruction Based on Collaboration</b>	344	1.96	0.20	No = 14 Yes = 330	No = 4.1 Yes = 95.9
<b>Share Instructional Resources</b>	344	1.99	0.11	No = 4 Yes = 340	No = 1.2 Yes = 98.8
<b>Frequently Celebrate Progress</b>	344	1.88	0.33	No = 43 Yes = 301	No = 12.5 Yes = 87.5
<b>Make Actionable Responses Based on Collaboration</b>	340	1.94	0.25	No = 22 Yes = 318	No = 6.5 Yes = 93.5
<b>Accountable to Teammates</b>	345	1.86	0.35	No = 48 Yes = 297	No = 13.9 Yes = 86.1
<b>Embrace District and State Accountability</b>	341	1.95	0.22	No = 17 Yes = 324	No = 5 Yes = 95
<b>Focus More on Learning and Less on Site-Based Governance Issues</b>	344	1.95	0.21	No = 16 Yes = 325	No = 4.7 Yes = 95.3

Note:

**N** = Number of principals in the sample

**Mean** = Average of the principals' ratings of the component

**Std. Deviation** = Standard Deviation, how much the data varies from the mean

**Frequency** = Number of times a "Yes" or "No" rating was selected

**Percent** = Percentage of "Yes" or "No" ratings



Table 4.7 shows little variability in the data on the presence of the third component, Results Orientation. In fact, the least present indicator of this component was being accountable to teammates, but 86.1% of the principals said that was present among their teacher teams/grade levels. The second least present indicator of this component was frequently celebrating progress, yet 87.5% of the principals said that was present among their teacher teams/grade levels. The remaining eight of the ten indicators for the presence of Results Orientation showed that 93% or more of the principals found they were present among their teacher teams/grade levels.

Table 4.8 lists the items from the survey that measured the presence of the fourth key component of teacher collaboration, Working Interdependently, and Table 4.9 follows on the next page with the descriptive statistics for that component.

Table 4.8

*Survey Items That Measured the Presence of Component 4, Working Interdependently*

<b>Collaboration Component</b>	<b>Survey Item</b>
	<i>Teacher teams/grade levels at your school:</i>
<b>Working Interdependently</b>	Have established trust in each other.
<b>Working Interdependently</b>	Support and rely on each other.
<b>Working Interdependently</b>	Share teaching practices.
<b>Working Interdependently</b>	Coach and encourage each other.
<b>Working Interdependently</b>	Share their weaknesses with each other.
<b>Working Interdependently</b>	Face difficult work with can-do attitudes.
<b>Working Interdependently</b>	Invite feedback from their peers.
<b>Working Interdependently</b>	The principal/assistant principal gives teams/grade levels frequent feedback on their collaboration.

Table 4.9

*Descriptive Statistics of the Presence of Component 4, Working Interdependently*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Frequency</b>	<b>Percent</b>
<b>Established Trust</b>	343	1.99	0.12	No = 5 Yes = 338	No = 1.5 Yes = 98.5
<b>Support and Rely on Each Other</b>	344	1.98	0.15	No = 8 Yes = 336	No = 2.3 Yes = 97.7
<b>Share Teaching Practices</b>	340	1.99	0.11	No = 4 Yes = 336	No = 1.2 Yes = 98.8
<b>Coach and Encourage Each Other</b>	340	1.96	0.18	No = 12 Yes = 328	No = 3.5 Yes = 96.5
<b>Share Weaknesses</b>	344	1.86	0.35	No = 48 Yes = 296	No = 14 Yes = 86
<b>Face Difficult Work with Can-Do Attitudes</b>	343	1.97	0.18	No = 12 Yes = 331	No = 3.5 Yes = 96.5
<b>Invite Feedback from Peers</b>	344	1.86	0.35	No = 48 Yes = 296	No = 14 Yes = 86
<b>Principal/Assistant Principal Gives Frequent Feedback on Collaboration</b>	341	1.84	0.36	No = 53 Yes = 288	No = 15.5 Yes = 84.5

Note:

N = Number of principals in the sample

(continued)

Table 4.9 (continued)

*Descriptive Statistics of the Presence of Component 4, Working Interdependently*

**Mean** = Average of the principals' ratings of the component

**Std. Deviation** = Standard Deviation, how much the data varies from the mean

**Frequency** = Number of times a "Yes" or "No" rating was selected

**Percent** = Percentage of "Yes" or "No" ratings

Table 4.9 shows little variability in the data on the presence of the fourth key component of teacher collaboration, Working Interdependently. In fact, the least present indicator of this component was the principal/assistant principal providing frequent feedback on collaboration, but 84% of the principals said that was present. The second and third least present indicators of this component (i.e., share weaknesses and invite feedback from peers) both showed that 86% of the principals said they were present among their teacher teams/grade levels. The remaining five of the eight indicators for the presence of Working Interdependently showed that 96.5% or more of the principals found they were present among their teacher teams/grade levels.

Although little variability was noted in the presence of the key components of collaboration, a multiple regression analysis was run to test each of the four hypotheses related to the presence of the components. Table 4.10 on the next page displays the Pearson correlations found in the multiple regression as well as the hypotheses to which they relate.

Table 4.10

*Pearson Correlation for the Presence of the Key Components of Collaboration*

<b>Hypotheses Tested</b>	<b>Collaboration Component</b>	<b>Pearson Correlation</b>
HO <sub>1</sub> : There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.	Job-Embedded Collaboration Time:	
	Regularly Scheduled Collaboration Times	.019
	Regularly Scheduled Meeting Locations	-.075
	Minutes Each Week	-.040
	Minutes Each Month	-.050
HO <sub>2</sub> : There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.	Common Goals	-.036
HO <sub>3</sub> : There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.	Results Orientation	-.021
HO <sub>4</sub> : There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.	Working Interdependently	.108*

\*Significant at  $p = .023$  (1-tailed)  $< 0.05$

The multiple regression included each of the components listed in Table 4.10 as well as the whole scale combined. Low correlations were noted for each of the variables in all four hypotheses.

HO<sub>1</sub>: There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 1.2% of the variance ( $R^2 = 0.012$ ,  $F(4, 349)=1.04$ ,  $p=.388$ ). As a result of  $p > .05$ , we fail to reject the null hypothesis and determine there is no statistically significant predictive relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>2</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained less than 1% of the variance ( $R^2 = 0.001$ ,  $F(1, 344)=0.442$ ,  $p=.507$ ). As a result of  $p > .05$ , we fail to reject the null hypothesis and determine there is no statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>3</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained less than 1% of the variance ( $R^2 = 0.000$ ,  $F(1, 346)=0.160$ ,  $p=.690$ ). As a result of  $p > .05$ , we fail to reject the null hypothesis and determine there is no statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>4</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 1.2% of the variance ( $R^2 = 0.012$ ,  $F(1, 342)=4.04$ ,  $p=.045$ ). As a result of  $p < .05$ , we reject the null hypothesis and determine there is a statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model. It is important to note that while a significant predictive relationship was found between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low. Table 4.11 shows that for every point gained in the principal’s rating on the presence of teacher teams working interdependently, one could predict a 1.393 increase in student achievement as measured by the Indiana “A-F” Accountability Model.

The whole model combined explained 3.6% of the variance ( $R^2 = 0.036$ ,  $F(7, 333)=1.77$ ,  $p=.093$ ). No significant predictive relationship for the whole model combined was noted. Table 4.11 displays the beta weights for the model.

Table 4.11

*Summary of Multiple Regression Predictors*

	Unstandardized Coefficients		Standardized Coefficients		
	$\beta$	Std. Error	$\beta$	t	p
(Constant)	2.247	1.059		2.123	.034
Common Goals	-.204	.555	-.027	-.368	.713
Results Orientation	-.773	.715	-.087	-1.080	.281
Working Interdependently	1.393	.487	.190	2.861	.004
Regularly Scheduled Collaboration Times	.367	.314	.077	1.168	.244
Regularly Scheduled Meeting Locations	-.268	.174	-.091	-1.547	.123
Minutes Each Week	-.013	.050	-.020	-.263	.792
Minutes Each Month	-.054	.065	-.068	-.837	.403

The effectiveness of each of the four key components of collaboration was also measured on the survey. Table 4.12 on the next page lists the items from the survey that measured the effectiveness of each of the four identified key components of teacher collaboration, and Table 4.13 follows with the descriptive statistics for these components.

Table 4.12

*Survey Items That Measured the Effectiveness of the Key Components of Teacher Collaboration*

<b>Collaboration Component</b>	<b>Survey Item</b>
<b>Job-Embedded Collaboration Time</b>	How would you rate the teacher teams/grade levels at your school on utilization of job-embedded collaboration time?
<b>Common Goals</b>	Discuss common learning challenges for their students.
<b>Common Goals</b>	Discuss shared outcomes for what they want their students to learn.
<b>Common Goals</b>	Develop specific and measureable goals for student achievement.
<b>Common Goals</b>	Collectively develop instructional strategies.
<b>Common Goals</b>	Collectively analyze common assessments.
<b>Results Orientation</b>	Have discussions based on student needs and accountability measures (i.e., data-directed dialogue).
<b>Results Orientation</b>	Monitor student progress with learning evidence or data.
<b>Results Orientation</b>	Develop specific and measureable goals for student achievement.
<b>Results Orientation</b>	Adjust their instruction to increase achievement as a result of their collaboration.
<b>Results Orientation</b>	Share instructional resources.
<b>Results Orientation</b>	Frequently celebration progress made by their team and/or students.

(continued)



Table 4.12 (continued)

*Survey Items That Measured the Effectiveness of the Key Components of Teacher Collaboration*

<b>Results Orientation</b>	<b>Make actionable responses based on their collaboration.</b>
<b>Results Orientation</b>	Are accountable to their teammates.
<b>Results Orientation</b>	Embrace district and state accountability.
<b>Results Orientation</b>	Focus more on learning and less on site-based governance issues.
<b>Working Interdependently</b>	Have established trust in each other.
<b>Working Interdependently</b>	Support and rely on each other.
<b>Working Interdependently</b>	Share teaching practices.
<b>Working Interdependently</b>	Coach and encourage each other.
<b>Working Interdependently</b>	Share their weaknesses with each other.
<b>Working Interdependently</b>	Face difficult work with can-do attitudes.
<b>Working Interdependently</b>	Invite feedback from their peers.
<b>Working Interdependently</b>	The principal/assistant principal gives teams/grade levels frequent feedback on their collaboration.

Table 4.13

*Descriptive Statistics of the Effectiveness of the Key Components of Teacher**Collaboration*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Component 1: Job Embedded Collaboration Time</b>			
<b>Job-Embedded Collaboration Time</b>	353	2.97	0.68
<b>Component 2: Common Goals</b>			
<b>Discuss Common Learning Challenges</b>	355	3.07	0.63
<b>Discuss Shared Outcomes</b>	349	2.94	0.69
<b>Develop Specific and Measurable Student Achievement Goals</b>	343	2.76	0.78
<b>Collectively Develop Instructional strategies</b>	349	2.88	0.73
<b>Collectively Analyze Common Assessments</b>	340	2.88	0.82
<b>Component 3: Results Orientation</b>			
<b>Discussions Based on Student Needs and Accountability Measures</b>	352	2.98	0.70
<b>Monitor Student Progress</b>	355	3.04	0.74
<b>Develop Specific and Measurable Student Achievement Goals</b>	345	2.78	0.73

(continued)

Table 4.13 (continued)

*Descriptive Statistics of the Effectiveness of the Key Components of Teacher Collaboration*

	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>
<b>Adjust Instruction Based on Collaboration</b>	353	2.83	0.69
<b>Share Instructional Resources</b>	355	3.33	0.66
<b>Frequently Celebrate Progress</b>	339	2.78	0.71
<b>Make Actionable Responses Based on Collaboration</b>	343	2.76	0.68
<b>Accountable to Teammates</b>	336	2.81	0.81
<b>Embrace District and State Accountability</b>	352	2.91	0.67
<b>Focus More on Learning and Less on Site-Based Governance Issues</b>	350	2.95	0.72
<b>Component 4: Working Interdependently</b>			
<b>Established Trust</b>	355	3.15	0.65
<b>Support and Rely on Each Other</b>	352	3.25	0.66
<b>Share Teaching Practices</b>	356	3.19	0.68
<b>Coach and Encourage Each Other</b>	352	3.01	0.69
<b>Share Weaknesses</b>	340	2.46	0.70
<b>Face Difficult Work with Can-Do Attitudes</b>	353	2.95	0.72
<b>Invite Feedback from Peers</b>	337	2.53	0.75
<b>Principal/Assistant Principal Gives Frequent Feedback on Collaboration</b>	327	2.59	0.71

(continued)

Table 4.13 (continued)

*Descriptive Statistics of the Effectiveness of the Key Components of Teacher Collaboration*

Note:

**N** = Number of principals in the sample

**Mean** = Average of the principals' ratings of the component

**Std. Deviation** = Standard Deviation, how much the data varies from the mean

*Quantitative Results on the Effectiveness of the Key Components of Teacher Collaboration*

While little variability was noted in the data on the presence of the key components of teacher collaboration, more was observed in the data on effectiveness. In order to find meaning and possible patterns within the variables for the effectiveness of the key components of teacher collaboration, simplify the data, and ultimately run a more meaningful multiple regression analysis, an explanatory factor analysis was conducted. This allowed the researcher to find the fewest number of factors that explained the largest amount of variation when answering the research questions.

Tests for the assumptions of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and the Bartlett's Test of Sphericity were met and showed that the data set was a good fit for the factor analysis. The first step of the factor analysis involved extracting the factors with the highest amounts of variance. Using eigenvalues allowed the researcher to learn more about how much variance was present in the variables, and

thus, be more able to extract those with the largest amounts. The scree plot in Figure 4.1 displays how the eigenvalues for the three factors which were extracted for the analysis compared.

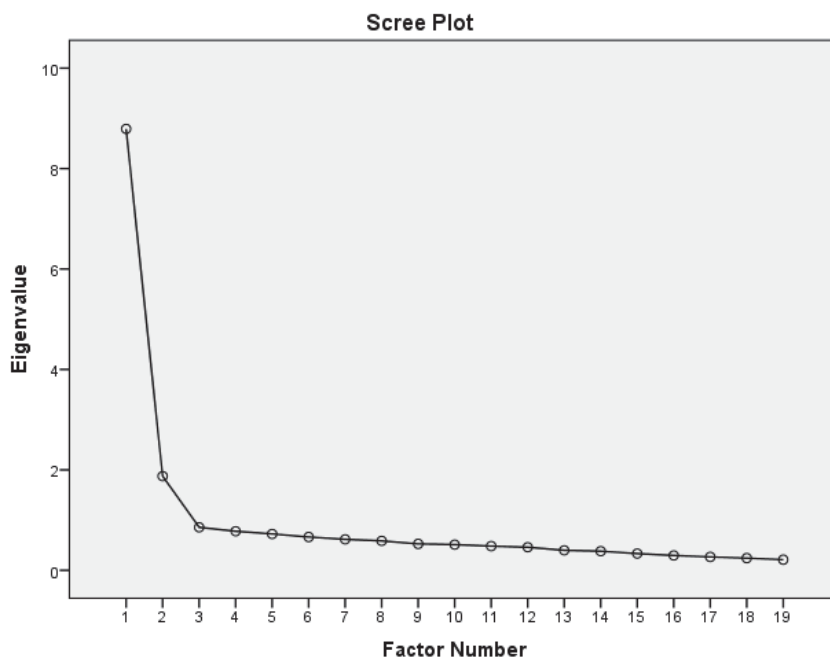


Figure 4.1

*Scree Plot*

The scree plot in Figure 4.1 exhibits three factors which explain a larger degree of variance in the study indicators. These factors explained nearly sixty percent of the total variance, as displayed in Table 4.14 on the next page.

Table 4.14

*Total Variance Explained*

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	9.909	45.041	45.041	9.395	42.706	42.706	8.374
2	1.992	9.053	54.095	1.597	7.261	49.967	6.550
3	1.066	4.848	58.942	.589	2.676	52.643	3.999
4	.925	4.205	63.147				
5	.718	3.266	66.413				
6	.698	3.171	69.584				
7	.640	2.911	72.495				
8	.615	2.797	75.291				
9	.605	2.751	78.042				
10	.539	2.450	80.492				
11	.505	2.295	82.787				
12	.490	2.229	85.016				
13	.463	2.106	87.122				
14	.444	2.017	89.139				
15	.396	1.799	90.938				
16	.348	1.582	92.521				
17	.330	1.499	94.019				
18	.317	1.441	95.461				
19	.295	1.341	96.801				
20	.263	1.194	97.996				
21	.234	1.065	99.060				
22	.207	.940	100.000				

Extraction Method: Maximum Likelihood.

Items with weaker loadings on the three factors, along with those which loaded on more than one factor, were then eliminated for a final, more streamlined factor analysis.

Table 4.15 displays the pattern matrix for the factor loadings.

Table 4.15

*Pattern Matrix*

	Factor		
	1	2	3
C3E3	.846		-.128
C2E3	.841		-.102
C3E2	.752		-.109
C2E2	.743	.159	.110
C2E5	.710		
C3E1	.631	-.126	
C3E7	.613		.151
C2E1	.569	-.209	
C4E8	.568		
C1E	.544	-.101	.177
C3E4	.540		.240
C2E4	.490		.398
C3E6	.366		.223
C4E1		-.913	
C4E2		-.912	
C4E4		-.600	.278
C4E5		-.541	.214
C4E7	.207	-.498	.138
C4E6	.241	-.477	
C3E8	.392	-.413	
C3E5	.136	-.150	.501
C4E3		-.389	.475

Extraction Method: Maximum Likelihood.

Rotation Method: Oblimin with Kaiser Normalization.

a. Rotation converged in 8 iterations.

The codes in the first column of Table 4.15 represent the effectiveness indicators within each of the identified four key components of collaboration that were measured on the survey and emerged as factor loadings. Table 4.16, Table 4.17, and Table 4.18 exhibit each of those codes, the effectiveness indicator they represent, and their factor loadings. Using this information, the three factors were identified as “Developing and Monitoring Specific Goals,” “Trusting, Supportive Collegiality,” and “Sharing Resources and Practices.”

Table 4.16

*Factor 1 Loadings and Effectiveness Indicators*

**Factor 1: Developing and Monitoring Specific Goals**

C3E3 (.846)	Develop Specific and Measurable Student Achievement Goals
C2E3 (.841)	Develop Specific and Measurable Student Achievement Goals
C3E2 (.752)	Monitor Student Progress
C2E2 (.743)	Discuss Shared Outcomes
C2E5 (.710)	Collectively Analyze Common Assessments
C3E1 (.631)	Discussions Based on Student Needs and Accountability Measures
C3E7 (.613)	Make Actionable Responses Based on Collaboration
C2E1 (.569)	Discuss Common Learning Challenges
C4E8 (.568)	Principal/Assistant Principal Gives Frequent Feedback on Collaboration
C1E (.544)	Utilization of Job-Embedded Collaboration Time
C3E4 (.540)	Adjust Instruction Based on Collaboration



Table 4.17

*Factor 2 Loadings and Effectiveness Indicators***Factor 2: Trusting, Supportive Collegiality**

C4E1 (-.913)	Establish Trust
C4E2 (-.912)	Support and Rely on Each Other
C4E4 (-.600)	Coach and Encourage Each Other
C4E5 (-.541)	Share Weaknesses
C4E7 (-.498)	Invite Feedback from Peers
C4E6 (-.477)	Face Difficult Work with Can-Do Attitudes

Table 4.18

*Factor 3 Loadings and Effectiveness Indicators***Factor 3: Sharing Resources and Practices**

C3E5 (.501)	Share Instructional Resources
C4E3 (.475)	Share Teaching Practices

Cronbach's alpha was again calculated using SPSS to determine the internal consistency of each of the variables within the factor analysis. Table 4.19 displays the Cronbach's alpha results for each of the three factors as well as the whole scale combined.

Table 4.19

*Cronbach's Alpha*

<b>Factor</b>	<b>Number of Items</b>	<b>Cronbach's Alpha</b>
Developing and Monitoring Specific Goals	11	.915
Trusting, Supportive Collegiality	6	.877
Sharing Resources and Practices	2	.702
Whole Scale Combined	19	.935

Cronbach's alpha results show all factors as well as the whole scale combined above .700. Nunnally (1967) asserted that a Cronbach's alpha of  $0.80 \leq \alpha < 1.00$  is highly reliable, and George and Mallery (2003) more recently explained that  $0.70 \leq \alpha < 0.80$  is Acceptable,  $0.80 \leq \alpha < 0.90$  is Good, and  $\alpha \geq 0.90$  is Excellent. Therefore, the data suggested that the scale is a reliable and valid measurement tool.

A multiple linear regression analysis was carried out in order to determine the relationship between the principal ratings on the effectiveness of each of the four key components of collaboration and student achievement as measured by the Indiana "A-F" Accountability Model. Table 4.20 on the next page lists the descriptive statistics for the three factors (the independent variables) and the school grades (the dependent variable).

Table 4.20

*Descriptive Statistics*

	Mean	Std. Deviation	N
School Grade	2.93	1.09	359
Factor Score 1	.065	.97	263
Factor Score 2	-.022	.981	263
Factor Score 3	.039	.817	263

Table 4.21 displays the Pearson correlations found in the multiple regression as well as the hypotheses to which they relate. Each of the factors on their own showed low correlations with student achievement as measured by the Indiana “A-F” Accountability Model grades ( $p < 0.05$ , 1-tailed).

Table 4.21

*Pearson Correlation for the Presence of the Key Components of Collaboration*

Hypotheses Tested	Collaboration Factor	Pearson Correlation
HO <sub>5</sub> There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.	Monitoring Specific Goals	.194*
HO <sub>6</sub> There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.	Trusting, Supportive Collegiality	-.230*
HO <sub>7</sub> There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.	Sharing Resources and Practices	.160*

\*Significant at  $p = .001$  (1-tailed)  $< 0.05$

\*Significant at  $p = .000$  (1-tailed)  $< 0.05$

\*Significant at  $p = .005$  (1-tailed)  $< 0.05$

The multiple regression included each of the collaboration factors listed in Table 4.21 as well as the whole scale combined. Low correlations were noted for each of the variables in all three hypotheses.

HO<sub>5</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 3.8% of the variance ( $R^2 = 0.038$ ,  $F(1, 261)=10.185$ ,  $p=.002$ ). As a result of  $p < .05$ , we reject the null hypothesis and determine there is a statistically significant predictive relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model. It is important to note that while a significant predictive relationship was found between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low.

HO<sub>6</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 5% of the variance ( $R^2 = 0.053$ ,  $F(1, 261)=14.523$ ,  $p<.001$ ). As a result of  $p < .05$ , we reject the null hypothesis and determine there is a statistically significant

predictive relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model. It is important to note that while a significant predictive relationship was found between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low.

HO<sub>7</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 2.6% of the variance ( $R^2 = 0.026$ ,  $F(1, 261)=6.865$ ,  $p=.009$ ). As a result of  $p < .05$ , we reject the null hypothesis and determine there is a statistically significant predictive relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model. It is important to note that while a significant predictive relationship was found between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low.

The whole model combined explained 5.8% of the variance ( $R^2 = 0.058$ ,  $F(3, 259)=5.267$ ,  $p=.002$ ). Table 4.22 on the next page displays the beta weights for the model. When the three factor scores are 0, student achievement as measured by the Indiana “A-F” school grades would start at 2.92. For every point gained in the

principal's rating on the effectiveness of developing and monitoring specific goals, one could predict a .096 increase in student achievement as measured by the Indiana "A-F" Accountability Model. The p-value for developing and monitoring specific goals was not statistically significant ( $p = .299 > 0.05$ ). For every point gained in the principal's rating on the effectiveness of trusting and supportive collegiality, one could predict a .195 decrease in student achievement as measured by the Indiana "A-F" Accountability Model. The p-value for trusting, supportive collegiality was statistically significant at  $p = .032 < 0.05$ ). For every point gained in the principal's rating on the effectiveness of sharing resources and Practices, one could predict a .007 increase in student achievement as measured by the Indiana "A-F" Accountability Model. The p-value for sharing resources and practices was not statistically significant at  $p = .950 > 0.05$ .

Table 4.22

*Summary of Multiple Regression Predictors*

	Unstandardized Coefficients		Standardized Coefficients		
	$\beta$	Std. Error	$\beta$	t	p
(Constant)	2.924	.066		44.352	.000
Developing and Monitoring Specific Goals	.096	.092	.085	1.040	.299
Trusting, Supportive Collegiality	-.195	.091	-.175	-2.155	.032
Sharing Resources and Practices	.007	.108	.005	.063	.950

### *Qualitative Results*

The following critical research questions were answered through qualitative procedures:

- 1) How do principals describe the collaboration process in their schools?
- 2) What do principals describe as the factors that impede effective collaboration in their schools?
- 3) What do principals describe as the factors that facilitate effective collaboration in their schools?
- 4) What relationship do principals perceive exists between the quality/extent of collaboration and student achievement?

Grounded theory served as the structure for item analysis and open coding, which helped the researcher discover patterns and key phrases principals used to describe collaboration and student achievement at their schools. These patterns and phrases were organized into emergent themes, and assertions were made based on the meanings of those emergent themes. Table 4.23 on the next page displays the first open ended item from the survey and the themes that emerged with some of the survey participant phrases supporting each of those themes. The phrases listed in the following four tables are the principals' actual words.

Table 4.23

*Emergent Themes for First Open Ended Survey Item*

<p><b>Survey Item:</b></p> <p>Please briefly describe the teacher collaboration process at your school.</p>	<p><b>Emergent Theme: Time</b></p> <ul style="list-style-type: none"> <li>-Teachers all have at least 50 minutes built in each week for collaboration</li> <li>-Thursday mornings for 35 minutes before school</li> <li>-an hour of collaboration/professional development time embedded into the contract day every Monday</li> <li>-Teachers meet daily for 50 minutes</li> <li>-Wednesday mornings each week...a 75 minute block of time.</li> <li>-3 days per week for 30 minutes</li> <li>-Every Wednesday after school for one hour</li> <li>-Monthly grade level collaboration</li> <li>-30 minutes every Wednesday during an early release time</li> <li>-Each Wednesday for one hour</li> <li>-Weekly for 45 minutes</li> <li>-20 minute team meetings twice weekly before school</li> <li>-Common prep times ...they meet 1-3 times per week</li> <li>-Once a week for an hour</li> <li>-Meet after school (each Wednesday) for 35 minutes</li> <li>-Teachers work in teams and meet at least twice a week</li> <li>-A minimum of one time per month...25 minutes in length per teacher contract</li> <li>-Teachers have (3) 45 minute planned professional development collaboration each week</li> <li>-40 minutes every Wednesday morning</li> <li>-Every Wednesday for 45 minutes</li> </ul> <p><b>Emergent Theme: Topic</b></p> <ul style="list-style-type: none"> <li>-We talk about the latest data targets and how we can provide re-teach, intervention for each level of student progress</li> <li>-We discuss student concerns, work on an annual book study on literacy practices, plan for upcoming events, and/or address larger concerns within our school</li> <li>-We all meet to discuss issues or specialized training</li> <li>-They plan together</li> <li>-Assess data, reorganize Tier groups, and adjust teaching to data</li> <li>-Teachers analyze data, discuss instructional strategies, and discuss specific interventions for students</li> </ul>
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(continued)



Table 4.23 (continued)

*Emergent Themes for First Open Ended Survey Item*

	<p>-They have many informal discussions about instruction and show each other new training information that they have taken</p> <p>-They collaborate on a variety of issues concerning their students, specific grade standards, goals/progress, and assessment</p> <p>-Grade level teams review achievement data such as SRI, Acuity, and RRR</p> <p>-Topics discussed at these meetings are of the teachers' concerns</p> <p>-Teachers meet to discuss topics/issues/data</p> <p>-Teachers discuss their days and concerns (procedural/building concerns, concerns for students/grades, personal</p> <p>-Teachers share specific student learning needs and problem solve together on how to best address those needs</p> <p>-RTI meetings, ACRs, Data Meetings, Staff Meetings</p> <p>-Rotate between grade level planning, data meetings, professional development, peer walk throughs, district initiative, PBIS, and curriculum and instruction</p> <p>-PD needs, data analysis needs, and community needs</p> <p>-Discussion based on the four essential questions</p> <p>-Teacher initiated in-services including technology (iPads, iMacs), using iPad apps, Thinking Maps, Blooms/Marzano, Whole Brain Instruction, reading comprehension strategies, etc.</p> <p>-Teachers discuss instructional practices in math and reading and how to implement technology into the classroom</p> <p>-Plan for RTI and develop lessons based on student needs</p> <p><b>Emergent Theme: Structure</b></p> <p>-We are a Professional Learning Community...Approximately 40% of our teachers have been trained by Richard and Becky DuFour (Solution Tree)</p> <p>-Administrators bring the agenda and topics to discuss every other week. Team leaders are responsible for assisting teams to run effective meetings during other meetings</p> <p>-Teachers meet by grade level</p> <p>-Two of the meetings are set by the principal and 2 each month are set by the teachers</p> <p>-Rotation of groups. 1 week is by department, next week by grade level</p>
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(continued)

Table 4.23 (continued)

*Emergent Themes for First Open Ended Survey Item*

	<ul style="list-style-type: none"> <li>-Weekly professional development meetings led by our master teacher</li> <li>-We follow the 8 Step Process</li> <li>-Our grades collaborate as a large group, but they also collaborate into smaller pairs</li> <li>-We have structured times, but the district has so many mandates put on us that there is very little time to deal with what our real needs are at the building level</li> <li>-We were trained and use a structured cycle</li> <li>-Two days a week are for staff collaboration on improvement goals. Two days a week are grade level teams addressing academic and behavioral needs of students. One day building level teams: Academic, Behavioral, and Climate</li> <li>-We have learning log meetings based on the 8 Step Process</li> <li>-Group norms were set as a building and in each grade level</li> <li>-We follow the Professional Learning Community Framework</li> <li>-Our district is an 8 Step Process district</li> <li>-We are a PLC and our collaboration time has been established through our PLC process</li> <li>-Agenda set; teacher coverage for classroom; themes for collaboration</li> <li>-We have four main committees that structure teacher collaboration for our school: Curriculum, School Climate, Data, and Steering</li> <li>-The NCA process has greatly driven these processes</li> <li>-We are both a Tap and an 8-step school, both of which require collaboration</li> </ul>
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Table 4.24 on the next page displays the second open ended item from the survey and the themes that emerged with some of the survey participant phrases supporting each of those themes.

Table 4.24

*Emergent Themes for Second Open Ended Survey Item*

<p><b>Survey Item:</b></p> <p>What factors impede effective teacher collaboration at your school?</p>	<p><b>Emergent Theme: Time</b></p> <ul style="list-style-type: none"> <li>-Teachers don't have common planning time with either of their PLCs. Time is limited</li> <li>-Time, pressures to do so many other things with the limited time they have</li> <li>-Just when the conversation starts and good things happen it is time to go</li> <li>-Need more time</li> <li>-Could benefit from more time</li> <li>-The meeting time on Wednesdays not being long enough</li> <li>-Time and our schedule. It is difficult to create a schedule that allows teachers to have a common planning period</li> <li>-Time as a limited resource</li> <li>-Teachers have volunteered to meet for 30 minutes each week...it is not part of the official work day</li> <li>-Lack of time to collaborate across grade levels</li> <li>-Finding the time during the work day is difficult</li> <li>-Scheduling is the main obstacle to collaboration</li> <li>-We seem to never have enough time</li> <li>-Time – weather delays</li> <li>-Limited schedules – prep time</li> <li>-Time...Time...Time</li> <li>-Snow days and delays</li> <li>-30 minutes is often not enough time for teachers to dive into any topic deep enough to be effective</li> <li>-Teacher contracts, not having common prep time</li> <li>-This year weather!!! Coverage</li> </ul> <p><b>Emergent Theme: Personalities</b></p> <ul style="list-style-type: none"> <li>-Debbie Downers</li> <li>-A somewhat competitive spirit has emerged due to the recent changes in the teacher evaluation process</li> <li>-Attitudes, morale</li> <li>-People with negative attitudes</li> <li>-We still have a couple of teachers with trust issues who do not like to share. One thinks she “owns” instruction and does not share</li> <li>-Teachers not wanting to share ideas thinking they are being boastful</li> </ul>
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(continued)

Table 4.24 (continued)

*Emergent Themes for Second Open Ended Survey Item*

	<p>-Personality conflicts and general understanding between teachers</p> <p>-There is some lack of trust in that everyone wants to appear excellent in all areas</p> <p>-One grade level has personality differences and although they tolerate each other, they don't really plan and share resources like other grade levels</p> <p>-Personality conflict at certain grade levels</p> <p>-A few grade levels have teachers who do not wish to work with their colleagues</p> <p>-Lack of trust, fear of conflict, lack of commitment, avoidance of accountability</p> <p>-Teacher attitudes</p> <p>-A lull in building trust and openness to start off</p> <p>-Personalities</p> <p>-Bad attitude or "elitist" attitude</p> <p>-Negative attitudes</p> <p>-Negative attitudes – personal disputes</p> <p>-Teachers that don't want to be team players</p> <p>-Trying to get teachers to remember that we are here to support each other and that it is ok to admit weaknesses and ask for help</p> <p><b>Emergent Theme: Focus</b></p> <p>-The lack of wanting to solve the problem versus complaining about students</p> <p>-Culture has been to not use team meetings as a planning time for the team. It does give them time to bond but bonding seems to be less about the classroom</p> <p>-At least one of my teachers wants to use the time to complain about not having enough time to do what they are expected to do rather than use the time to accomplish something</p> <p>-Teachers are not focused at the end of the day</p> <p>-Personal agendas that take the group off task or distract, individuals occasionally losing sight of the goal/purpose for the meeting and the team leader not redirecting</p> <p>-Vision: sometimes it's hard to keep my staff focused on the same thing</p> <p>-Teachers are not in the habit of creating a professional structure or course...Teams are in the habit of having team time with little structure or purpose</p>
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(continued)

Table 4.24 (continued)

*Emergent Themes for Second Open Ended Survey Item*

	<p><i>-At times it may be a clear focus</i></p> <p><i>-1. Inefficiency of time use (too much time complaining about problem instead of working on solution); 2. Focus on non-learning topics (planning upcoming field trip, parent issues, etc.)</i></p> <p><i>-The school needs unifying goals, so that everyone is heading in a similar direction, and a way to be able to determine if goals are being met</i></p> <p><i>-Our district has too many initiatives in place and teachers are being pulled in too many directions</i></p> <p><i>-Teachers holding one another accountable to start on time and stay focused on the instructional goals</i></p> <p><i>-It can be a challenge to prioritize agenda items</i></p> <p><i>-Having specific outcomes/goals for each session</i></p> <p><i>-Other meetings getting scheduled</i></p> <p><i>-While there is time built into our schedule for team meetings, staff PD, etc. there is still so much on our plates that we feel that we are never completing anything effectively</i></p> <p><i>-When teachers are required to collaborate without training and direction, teachers often revert to casual conversations that sometimes improve teacher morale and sometimes slips into toxic chatter</i></p> <p><i>-We do not have a set agenda to focus the work done during the grade level meetings</i></p> <p><i>-Too many times they get caught up in the immediate needs or days' events which prohibits more long range planning or data processing</i></p> <p><i>-I need to better direct the focus of these regularly scheduled meetings</i></p>
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Table 4.25 on the next page displays the third open ended item from the survey and the themes that emerged with some of the survey participant phrases supporting each of those themes.

Table 4.25

*Emergent Themes for Third Open Ended Survey Item*

<p><b>Survey Item:</b></p> <p>What factors facilitate effective teacher collaboration at your school?</p>	<p><b>Emergent Theme: Leadership</b></p> <ul style="list-style-type: none"> <li>-Direct involvement by the principal</li> <li>-Principal expectation of collaboration</li> <li>-Excellent teachers who feel very strongly about providing a quality experience for students</li> <li>-Principal support and encouragement</li> <li>-A leader who can guide them in understanding what the data is telling them</li> <li>-Encouragement by district and building administrators and teacher leaders</li> <li>-Strong leadership by grade chairs or others committed to the process</li> <li>-Several influential teachers at key locations that can lead by example</li> <li>-Administrative expectations</li> <li>-Academic coaches for training</li> <li>-A response section for written feedback</li> <li>-Key teachers driving the conversations</li> <li>-Grade level leadership</li> <li>-I build capacity in my teacher leaders to improve team collaboration</li> <li>-Support from administration</li> <li>-Teachers that want to help other teachers</li> <li>-Leadership expectations</li> <li>-Highly Effective teachers helping others</li> <li>-Head teachers are designated to keep communication flowing between grade levels and administration. They facilitate grade level meetings</li> <li>-School guidance counselor, literacy coach, and principal lead some collaboration and set expectations</li> </ul> <p><b>Emergent Theme: Time</b></p> <ul style="list-style-type: none"> <li>-They are given the time to do it</li> <li>-Time has been ear marked for collaboration</li> <li>-A scheduled time to meet during the work day</li> <li>-A common prep time is the most important factor</li> <li>-There is ample time to meet</li> <li>-Time</li> </ul>
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(continued)

Table 4.25 (continued)

*Emergent Themes for Third Open Ended Survey Item*

	<ul style="list-style-type: none"> <li>-Before/After school meeting times</li> <li>-Common prep time</li> <li>-Job embedded time for teachers to collaborate</li> <li>-Our schedule works great</li> <li>-The daily common planning periods help with allowing time for grade levels to meet</li> <li>-Time set aside weekly for collaboration</li> <li>-Not having mandated times works best. My teachers are expected to collaborate with each other but they know they can do this when it is acceptable for them as a team</li> <li>-Time for meetings</li> <li>-Time is used positively and for a purpose where there are outcomes</li> <li>-The schedule that we use...allows them the time and availability within the school day to get together</li> <li>-More time for speakers, presentations, and deeper collaboration</li> <li>-Teachers are given the time to collaborate and it is viewed as important by the administration</li> <li>-A regularly structured time to meet</li> <li>-Creating a schedule that everyone can have time set aside</li> </ul> <p><b>Emergent Theme: Trusting, Supportive Collegiality</b></p> <ul style="list-style-type: none"> <li>-We have an incredible group of dedicated staff members who hold themselves accountable to a very high standard</li> <li>-Open honest communication</li> <li>-Teacher willingness and desire to collaborate and support each other</li> <li>-Cooperation among teachers</li> <li>-There is a very good cooperative climate...a very good sense of family</li> <li>-Trust and collegiality of staff (including administrator)</li> <li>-An openness among staff...family atmosphere that encourages collaboration</li> <li>-Team mentality to get things done together for all the kids</li> <li>-Honesty and being able to accept honesty...believing that if someone makes suggestions, they are criticizing, but trying to help is a plus</li> <li>-A staff that is willing to work with one another</li> <li>-School is a strong family/community which is felt by all</li> </ul>
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(continued)

Table 4.25 (continued)

*Emergent Themes for Third Open Ended Survey Item*

	<ul style="list-style-type: none"> <li>-Trust and relationships that exist among the staff</li> <li>-We have strong grade level teams who trust and support each other</li> <li>-Our teachers support and like each other</li> <li>-Looking forward to learning from each other -The longer they are a team, the more dependent they are on each other</li> <li>-Camaraderie</li> <li>-Trust in each other. Non-threatening environment</li> <li>-A great deal of peer reinforcement</li> <li>-Trust, commitment to overall success of every student</li> </ul>
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Table 4.26 displays the final open ended item from the survey and the themes that emerged with some of the survey participant phrases supporting each of those themes.

Table 4.26

*Emergent Themes for Final Open Ended Survey Item*

<p><b>Survey Item:</b></p> <p>Describe the relationship between teacher collaboration and student learning at your school?</p>	<p><b>Emergent Theme: Highly Correlated</b></p> <ul style="list-style-type: none"> <li>-It has a direct correlation</li> <li>-Very effective. The more collaboration the higher student achievement</li> <li>-Our students face a variety of serious issues that impeded learning. Without collaboration, we would have no success</li> <li>-Huge. Student learning is enhanced</li> <li>-There is a positive connection between the two</li> <li>-Teacher collaboration is vital to improved student success</li> <li>-It has led to an increase in achievement at all schools and grade levels</li> <li>-When collaboration occurs, student learning increases</li> <li>-They know this is a necessary part of student growth. If we see a need or a weaker area, then we have PD to discuss the needs and find an outside trainer to educate us further</li> </ul>
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(continued)



Table 4.26 (continued)

*Emergent Themes for Final Open Ended Survey Item*

	<ul style="list-style-type: none"> <li>-Positive relationship has resulted in data driven results that have directly impacted student learning</li> <li>-Teachers that are finding time to work together are seeing increased achievement with their students</li> <li>-Teacher collaboration has fostered clear visions, goals, and implementation which has directly impacted student learning in a positive manner</li> <li>-The collaboration helps it happen</li> <li>-We have shown significant growth in Acuity Predictive C data from last year to this year because our eye has been kept on that mark</li> <li>-We have been a high performing school, and this is directly attributable to having excellent teachers collaborate on student data, curriculum, instruction, and assessment</li> <li>-The more we collaborate, look at data, and share our strengths to help and encourage everyone, the more our students learn</li> <li>-I have seen an improvement at all levels of instruction</li> <li>-Our students make progress due to regular monitoring and designing instruction to meet their needs. All of our teachers bring their strengths to the table to help each other. All of our students benefit from the shared knowledge</li> <li>-These meetings help grade level teams support each other, thus helping to move students forward</li> <li>-The more teachers collaborate, the better students learn</li> </ul>
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Finally, the following mixed-methods research question integrated and extended the quantitative and qualitative results of the study:

To what extent do themes generated from responses to the open-ended questions help inform the measured relationship between principal perceptions of teacher collaboration in their schools and student achievement?

The quantitative and qualitative findings were analyzed side by side in order to answer this question. Table 4.27 displays a summary of the quantitative findings.

Table 4.27

*Summary of Quantitative Findings*

<b>Quantitative Findings</b>
<p><b>HO<sub>1</sub>: Failed to Reject</b> (<math>p = .388 &gt; .05</math>)</p> <p><b>Determination:</b> There is no statistically significant predictive relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.</p>
<p><b>HO<sub>2</sub>: Failed to Reject</b> (<math>p = .507 &gt; .05</math>)</p> <p><b>Determination:</b> There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.</p>
<p><b>HO<sub>3</sub>: Failed to Reject</b> (<math>p = .690 &gt; .05</math>)</p> <p><b>Determination:</b> There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.</p>
<p><b>HO<sub>4</sub>: Rejected</b> (<math>p = .045 &lt; .05</math>)</p> <p><b>Determination:</b> There is a statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.</p>
<p><b>HO<sub>5</sub>: Rejected</b> (<math>p = .002 &lt; .05</math>)</p> <p><b>Determination:</b> There is a statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.</p>

(continued)

Table 4.27 (continued)

*Summary of Quantitative Findings*

<b>Quantitative Findings</b>
<p><b>HO<sub>6</sub>: Rejected</b> (<math>p &lt; .001 &lt; .05</math>)</p> <p><b>Determination:</b> There is a statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.</p> <p><b>HO<sub>7</sub>: Rejected</b> (<math>p = .009 &lt; .05</math>)</p> <p><b>Determination:</b> There is a statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.</p>

Table 4.28 shows a summary of the qualitative findings.

Table 4.28

*Summary of Qualitative Findings*

<b>Qualitative Findings</b>
<p><b>Survey Item:</b> Please briefly describe the teacher collaboration process at your school.</p> <p><b>Emergent Theme: Time</b></p> <p>Consistencies:</p> <ul style="list-style-type: none"> <li>Principals described time in terms of how many days and how many minutes each week or each month</li> </ul> <p>Inconsistencies:</p> <ul style="list-style-type: none"> <li>Principals described the duration of time for collaboration being different, with some as short as 25 minutes and some as long as one hour</li> <li>Principals described the number of days for collaboration being different, including reports as much as daily, three days per week, one day per week, one day per month</li> </ul>

(continued)

Table 4.28 (continued)

*Summary of Qualitative Findings***Emergent Theme: Topic**

## Consistencies:

- Principals described a range of topics discussed during collaboration

## Inconsistencies:

- Topics of collaboration were not consistent, including focusing on such topics as data, data targets, student concerns, teacher concerns, book studies, planning for upcoming events, addressing larger concerns for the whole school, RTI, instructional strategies, grade level planning, teacher planning, professional development, district initiatives, PBIS, technology such as iPad apps, etc.

**Emergent Theme: Structure**

## Consistencies:

- Principals reported structures for collaboration which included things such as agendas, discussion protocols, common understanding of who develops the agendas and when, rotations of topics/groups, groupings such as grade level/department collaboration groups, etc.

## Inconsistencies:

- Principals reported a range of processes they follow as a structure for collaboration, including the 8 Step Process, PLC trained by Richard and Becky DuFour, administrators driving their own process, teachers driving their own process, committees driving the process, processes based on rotation of topics such as student needs and professional development, and processes driven by NCA and TAP (acronyms not defined)

**Survey Item:** What factors impede effective teacher collaboration at your school?

**Emergent Theme: Time**

## Consistencies:

- Principals reported not having enough collaboration time due to reasons such as a lack of common planning time in their schedules, a need for longer meetings, limited schedules and available prep time, a need for time to do more things such as cross grade level collaboration, weather delays interfering with collaboration time, etc.

(continued)

Table 4.28 (continued)

*Summary of Qualitative Findings***Inconsistencies:**

- Clear consistencies of principals wanting more collaboration time was clear in this question, but some principals also reported reasons for needing more time. These reasons were often inconsistent, coinciding with the inconsistencies noted in topics of collaboration.

**Emergent Theme: Personalities****Consistencies:**

- Principals reported negative attitudes, personality conflicts, elitist attitudes, competitiveness among teachers, lack of trust, unwillingness to share, fear, unwillingness to admit weaknesses, etc. as being factors that impede collaboration.

**Inconsistencies:**

- Principals often reported these personality traits being present among a grade level, a few grade levels, or a few teachers, but not often the whole school. However, these few were consistently reported as factors that impeded collaboration for the school.

**Emergent Theme: Focus****Consistencies:**

- Principals reported a lack of focus due to such things as having the meetings at the end of the day when teachers are tired, spending more time on complaining about the problem than finding the solution, bonding as a team but on topics that are more about the team and less about the classroom, focusing on personal agendas, losing sight of the purpose or overall goal of the team, lack of unifying goals among the school, having too many topics to discuss, topics coming from the district that needed to be covered and pulled them away from a focus, having specific outcomes or goals for collaboration, etc.

**Inconsistencies:**

- Clear consistencies of principals reporting a lack of focus emerged. However, some reported the need of that focus to be on long-term planning and data, teacher-directed goals/purposes, administrator directed goals/purposes, professional development, etc. This coincides with the inconsistencies noted in topics of collaboration.

(continued)

Table 4.28 (continued)

*Summary of Qualitative Findings*

<p><b>Survey Item:</b> What factors facilitate effective teacher collaboration at your school?</p> <p><b>Emergent Theme: Leadership</b> Consistencies:</p> <ul style="list-style-type: none"> <li>Principals reported the need for involvement of key leaders to facilitate, direct, guide, encourage, and/or support collaboration.</li> </ul> <p>Inconsistencies:</p> <ul style="list-style-type: none"> <li>Principals reported these key leaders as being teachers, guidance counselors, instructional coaches, assistant principals, principals, personnel from the district office, and/or different combinations of these people.</li> </ul> <p><b>Emergent Theme: Time</b> Consistencies:</p> <ul style="list-style-type: none"> <li>Principals reported that scheduled, job-embedded time to collaborate and having enough time to complete the necessary tasks within the meetings facilitated collaboration.</li> </ul> <p>Inconsistencies:</p> <ul style="list-style-type: none"> <li>Principals reported the collaboration time as being before school, after school, during teacher common prep times, built within the schedule, and/or not even having scheduled “mandated” collaboration times.</li> </ul> <p><b>Emergent Theme: Trusting, Supportive Collegiality</b> Consistencies:</p> <ul style="list-style-type: none"> <li>Principals reported that relationships of trust, openness, honesty, a willingness to support each other, a family feel, peer reinforcement, etc. facilitated collaboration.</li> </ul> <p>Inconsistencies:</p> <ul style="list-style-type: none"> <li>No clear inconsistencies within the emergent theme of Trusting, Supportive Collegiality were noted.</li> </ul>
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(continued)

Table 4.28 (continued)

*Summary of Qualitative Findings*

**Survey Item:** Describe the relationship between teacher collaboration and student learning at your school?

**Emergent Theme: Highly Correlated**

Consistencies:

- Principals reported that teacher collaboration directly correlated with student achievement and that the more the teachers collaborated and the more effective they were at collaboration, the more learning increased.

Inconsistencies:

- There were inconsistencies in how principals defined student achievement and/or student learning. Many did not define it, while some defined it as increased assessment data. Assessments noted were varied.

Chapter 4 presented the data analysis for the quantitative and qualitative data of this mixed methods study. Consistencies and inconsistencies in the data were explored to reveal a deeper understanding of the phenomena of teacher collaboration and student achievement. Chapter 5 will further discuss the results, present conclusions and implications, provide recommendations for the field of education, examine limitations, and offer suggestions for future research.

CHAPTER 5  
SUMMARY AND DISCUSSION

*Introduction*

This chapter will begin by further discussing the questions examined in the study and presenting conclusions and implications. Next, an examination of limitations and suggestions for future research will be offered.

This concurrent embedded mixed-methods study developed an instrument to measure principals' perceptions of teacher collaboration in their schools. The study further examined the relationship between perceptions of teacher collaboration and student achievement as measured by the Indiana “A-F” Accountability Model. The following research questions guided the study:

- 1) What are the most important components of teacher collaboration?
- 2) What key components of teacher collaboration do principals see most often in their schools?
- 3) How does the presence and effectiveness of these components in collaboration among elementary teacher teams relate to student achievement?
- 4) How do principals describe the collaboration process in their schools?
- 5) What do principals describe as the factors that impede effective collaboration in their schools?



- 6) What do principals describe as the factors that facilitate effective collaboration in their schools?
- 7) What relationship do principals perceive exists between the quality/extent of collaboration and student achievement?
- 8) To what extent do themes generated from responses to the open-ended questions help inform the measured relationship between principal perceptions of teacher collaboration in their schools and student achievement?

### *Discussion of the Findings*

*Research Question #1: What are the most important components of teacher collaboration?*

Four key components of teacher collaboration were identified through the review of literature and further defined in Chapter Two. The four key components of teacher collaboration include: 1) Job-Embedded Collaboration Time; 2) Common Goals; 3) Results Orientation; and 4) Working Interdependently.

The literature reviewed consistently noted and described job-embedded time for collaboration. Job-embedded collaboration time includes regularly scheduled collaboration times and identified meeting locations. This time is called embedded because it is included as part of the teacher work day. It is not additional time that is added before the beginning or after the ending of the teacher's typical working hours. Studies reported this time as a duration of anywhere between 40 and 90 minutes per meeting.

The second component, common goals, involves discussion of common learning challenges and shared outcomes. These desired outcomes should be specific and measureable. Teacher teams with common goals decide what specifically they want their students to learn, analyze common methods of assessment for that learning, and collectively develop instructional strategies for remediating or extending and enriching student understanding of what has been assessed.

The third component, results orientation, highlights a characteristic of successful teacher collaboration teams identified in the literature as having data-directed dialogue based on student needs and accountability measures. These successful teams further exhibited a results orientation by frequently monitoring student progress, sharing resources, and adjusting instruction to increase student achievement. Common characteristics of these teams included replacing excuses with specific strategies, celebrating quick wins, holding mutual responsibility for student outcomes, embracing accountability, and developing actionable responses. These teams were also known for focusing more on learning and less on site-based governance issues.

The fourth and final identified important component of teacher collaboration, working interdependently, was exhibited by teams who supported and relied on each other. Teachers on these teams openly shared practices, had built trust among each other and other staff members, coached and encouraged each other, and felt safe to share weaknesses. They humbly helped each other seek and utilize best practice. In other words, success was about moving forward for students despite which teacher received the

credit. These teachers faced difficult work with can-do attitudes, they helped each other with tasks, and they invited feedback from peers and administrators.

*Research Question #2: What key components of teacher collaboration do principals see most often in their schools?*

This question was answered through principals' ratings on a survey regarding the presence of each of the four identified key components. Data gathered from these ratings were used to test the following hypotheses:

HO<sub>1</sub>: There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana "A-F" Accountability Model.

HO<sub>2</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana "A-F" Accountability Model.

HO<sub>3</sub>: There is no statistically significant relationship between principal ratings on the presence teacher collaboration teams with results orientation and student achievement as measured by the Indiana "A-F" Accountability Model.

HO<sub>4</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana "A-F" Accountability Model.

There was very little variability in the data on the presence of the four key components of collaboration. Nearly all principals reported that their school had regularly scheduled collaboration times and specified meeting locations. Very few principals reported duration of collaboration times at their school to be less than what was defined in the literature as reviewed in chapter 2 (i.e., less than 40 minutes). Nearly all principals reported that teacher teams at their schools collaborated with common goals and results orientation. Likewise, nearly all principals reported that teacher collaboration teams at their school worked interdependently.

As might have been expected with data having such little variability, weak correlations between the presence of each of the four key components of teacher collaboration and student achievement were found. The results of the first four hypotheses tests were as follows:

HO<sub>1</sub>: There is no statistically significant relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 1.2% of the variance ( $R^2 = 0.012$ ,  $F(4, 349)=1.04$ ,  $p=.388$ ). As a result of  $p > .05$ , the researcher failed to reject the null hypothesis and determined there was no statistically significant predictive relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>2</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained less than 1% of the variance ( $R^2 = 0.001$ ,  $F(1, 344)=0.442$ ,  $p=.507$ ). As a result of  $p > .05$ , the researcher failed to reject the null hypothesis and determined there was no statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with common goals and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>3</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained less than 1% of the variance ( $R^2 = 0.000$ ,  $F(1, 346)=0.160$ ,  $p=.690$ ). As a result of  $p > .05$ , the researcher failed to reject the null hypothesis and determine there was no statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

HO<sub>4</sub>: There is no statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 1.2% of the variance ( $R^2 = 0.012$ ,  $F(1, 342)=4.04$ ,  $p=.045$ ). As a result of  $p < .05$ , the researcher rejected the null hypothesis and determined there was a statistically significant predictive relationship between principal ratings on the presence of teacher collaboration teams with results orientation and student achievement as measured by the Indiana “A-F” Accountability Model.

No significant predictive relationships were found between the presence of the first three identified key components of teacher collaboration and student achievement. Nearly all principals reported that these components were present in their school regardless of having a higher or lower Indiana “A-F” Accountability Model grade. Similarly, nearly all principals reported the fourth key component of collaboration being present at their school. While a significant predictive relationship was found between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low. Finding significance in the predictive relationship between teacher teams working interdependently and student achievement meant that while the correlation was low, it did not merely happen by chance. Further understanding of principals’ ratings on the effectiveness of these components and their descriptions of teacher collaboration at their schools became even more important to the study.

*Research Question #3: How does the presence and effectiveness of these components in collaboration among elementary teacher teams relate to student achievement?*

This question was answered through principals' ratings on a survey regarding the presence and effectiveness of each of the four identified key components. Data gathered from these ratings were used to test the following hypotheses in addition to the four previously discussed:

HO<sub>5</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana "A-F" Accountability Model.

HO<sub>6</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana "A-F" Accountability Model.

HO<sub>7</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana "A-F" Accountability Model.

While little variability was noted in the data on the presence of the key components of teacher collaboration, more was observed in the data on effectiveness. An explanatory factor analysis enabled the researcher to find meaningful patterns within the effectiveness variables, simplify the data, and ultimately run a more meaningful multiple regression analysis. This allowed the researcher to find the fewest number of factors that explained the largest amount of variation when answering the research questions. The

researcher found the effectiveness variables within a large data set that related most closely with each other and might have been measuring the same thing. Each factor that emerged represented the combination of overlapping effectiveness variables into a single index that measured the construct. The factors were identified as “Developing and Monitoring Specific Goals,” “Trusting, Supportive Collegiality,” and “Sharing Resources and Practices” and were tested in the three different hypotheses.

The results of the final three hypotheses tests are as follows:

HO<sub>5</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 3.8% of the variance ( $R^2 = 0.038$ ,  $F(1, 261)=10.185$ ,  $p=.002$ ). As a result of  $p < .05$ , the researcher rejected the null hypothesis and determined there was a statistically significant predictive relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model. While a significant predictive relationship was found between principal ratings on the effectiveness of teacher teams monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low. Finding significance in the predictive relationship between teacher teams monitoring specific goals and student achievement meant that while the correlation was low, it did not merely happen by chance.



HO<sub>6</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 5% of the variance ( $R^2 = 0.053$ ,  $F(1, 261)=14.523$ ,  $p<.001$ ). As a result of  $p < .05$ , the researcher rejected the null hypothesis and determined there was a statistically significant predictive relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model. While a significant predictive relationship was found between principal ratings on the effectiveness of teacher teams with trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low. Finding significance in the predictive relationship between teacher teams with trusting, supportive collegiality and student achievement meant that while the correlation was low, it did not merely happen by chance.

HO<sub>7</sub>: There is no statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model.

The multiple regression performed in SPSS to test this hypotheses found that this model explained 2.6% of the variance ( $R^2 = 0.026$ ,  $F(1, 261)=6.865$ ,  $p=.009$ ). As a result of  $p < .05$ , the researcher rejected the null hypothesis and determined there was a statistically significant predictive relationship between principal ratings on the

effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model. While a significant predictive relationship was found between principal ratings on the effectiveness of teacher teams sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model, the correlation was low. Finding significance in the predictive relationship between teacher teams sharing resources and practices and student achievement meant that while the correlation was low, it did not merely happen by chance.

All three hypotheses tests on the effectiveness components showed low correlations in the predicative relationship while finding statistical significance, meaning the correlations were all certainly different from zero. In spite of having limited variability in principal responses to the survey, all of the derived factors from the scale were significant predictors of student achievement. Through factor analysis, the number of items on the scale was reduced, and three factors were extracted which were all predictors of student achievement. An instrument with very high reliability was developed. This instrument can be used with principals to identify areas of weakness in teacher collaboration quickly and accurately. Although most principals endorsed most items, the tool clearly can be useful in self-evaluation of collaboration. Further understanding of principals’ descriptions of teacher collaboration at their schools became even more important to the study.

*Research Question #4: How do principals describe the collaboration process in their schools?*

Principals consistently described the collaboration process in their schools in terms of time, topic, and structure, which became the three emergent themes in the qualitative data collected to answer this question. Consistencies and inconsistencies in the descriptions were noted for each of the emergent themes.

Principals described time in terms of how many days and how many minutes each week or each month. However, they described the duration of time for collaboration being different, with some as short as 25 minutes and some as long as one hour. In addition, the frequency of days for collaboration was different, including reports of teacher teams meeting as much as daily, three days per week, one day per week, one day per month, or even having no mandatory meetings at all. These descriptions of time spent on collaboration brought more insight to results of the test for  $H_{O1}$ , which found no statistically significant predictive relationship between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data revealed great differences in terms of duration and frequency of this time.

Principals also consistently described collaboration in terms of topics discussed by the teacher teams. They reported a range of topics discussed during collaboration. However, these topics of collaboration were not consistent. Teams were reported to focus on such topics as data, data targets, student concerns, teacher concerns, book

studies, planning for upcoming events, addressing larger concerns for the whole school, RTI, instructional strategies, grade level planning, teacher planning, professional development, district initiatives, PBIS, technology such as iPad apps, etc. Some of these topics focused on student achievement, while many clearly did not. Similar to prior studies on professional learning communities and teacher collaboration, this study found that the terms professional learning communities or teacher collaboration teams meant very different things to different schools. These varied descriptions of topics for teacher collaboration brought more insight to results of the test for HO<sub>2</sub>, which found no statistically significant predictive relationship between principal ratings on the presence of common goals and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data revealed great differences in terms of specific, common goals being discussed frequently related to student achievement versus defining other common outcomes such as professional development or school-wide event planning. These descriptions of varied collaboration topics also brought deeper understanding to the results of the test for HO<sub>3</sub>, which found no statistically significant predictive relationship between principal ratings on the presence of results orientation and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data again revealed great differences in terms of the results teacher teams were trying to achieve during collaboration time (i.e., topics based on student achievement, book studies, teacher planning, event planning, etc.).

The third theme that emerged from principals' descriptions of collaboration in their schools was structure. Principals reported structures for collaboration which included things such as agendas, discussion protocols, a common understanding of who develops the agendas and when, rotations of topics/groups, groupings such as grade level/department collaboration groups, etc. While it was evident that principals identified the importance of defining collaboration time through certain processes and procedures that served as structures for collaboration, they reported a range of processes they followed. For example, varied structures for collaboration were reported in different schools, including the 8 Step Process, PLCs as defined and trained by Richard and Becky DuFour, administrators driving their own process, teachers driving their own process, committees driving the process, processes based on a rotation of topics such as student needs and professional development, and processes driven by NCA and TAP (acronyms not defined). Again, this qualitative data revealed that while nearly all principals reported the four key components of collaboration being present in their schools, their collaboration was carried out with different structures, topics of focus, duration of time, and frequency of meetings across different schools.

*Research Question #5: What do principals describe as the factors that impede effective collaboration in their schools?*

Three themes emerged from principals' descriptions of the factors that impeded effective collaboration at their schools. These three themes were time, personalities, and focus.

Principals reported not having enough collaboration time due to reasons such as a lack of common planning time in their schedules, a need for longer meetings, limited schedules and available prep time, a need for time to do more things such as cross grade level collaboration, weather delays interfering with collaboration time, etc. While principals indicated a desire for more collaboration time in their schools, the reasons for wanting that time were varied, coinciding with the inconsistencies noted under the theme of topics of collaboration. Inconsistencies in job-embedded collaboration time, collaborative goals, and desired results were again observed in the qualitative data collected from the descriptions of factors that impeded effective teacher collaboration.

The second theme that emerged as a factor that impeded effective teacher collaboration was personalities. Principals reported negative attitudes, personality conflicts, elitist attitudes, competitiveness among teachers, lack of trust, unwillingness to share, fear, unwillingness to admit weaknesses, and more as being factors that impeded collaboration. Principals often reported these personality traits being present among a grade level, a few grade levels, or a few teachers, but not often the whole school. However, these few teams or individuals at schools were consistently reported as factors that impeded collaboration for the school. The test for HO<sub>4</sub> found a statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model. The test for HO<sub>6</sub> found a statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model.

Additionally, the test for HO<sub>7</sub> found a statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model. While the correlations were low for these predictive tests, they provided evidence that teachers working interdependently affect student achievement. Furthermore, the qualitative data collected from the principals suggests that having even just a few negative or difficult personalities on teacher teams can impede progress for the school.

The final theme that emerged as a factor that impeded collaboration was focus. Principals reported a lack of focus due to such things as having the meetings at the end of the day when teachers were tired, teachers spending more time on complaining about the problem than finding the solution, team bonding taking place on topics that were more about the team and less about the classroom, focusing on personal agendas, losing sight of the purpose or overall goal of the team, lack of unifying goals among the school, having too many topics to discuss, topics coming from the district that needed to be covered and pulled the teams away from a focus, not having specific outcomes or goals for collaboration, etc. While clear consistencies of principals reporting a lack of focus emerged, the stated needs for that focus were again varied, including focusing on long-term planning and data, teacher-directed goals/purposes, administrator directed goals/purposes, professional development, etc. This coincides with the inconsistencies noted in the emergent theme of topics of collaboration. The test for HO<sub>5</sub> found a statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the

Indiana “A-F” Accountability Model. However, the correlation was low. The qualitative data again revealed that schools were developing and monitoring very different goals and outcomes for their collaboration meetings. Teams having common goals focusing on student achievement are likely to produce student achievement data that is very different from teams focusing on other common goals, such as event planning or the latest book study. This explains the overall low correlation within the population sample, which included a rare study of wide spread data on teacher collaboration and its relationship to student achievement.

*Research Question #6: What do principals describe as the factors that facilitate effective collaboration in their schools?*

Three themes emerged as factors that facilitated effective collaboration in schools, including leadership, time, and trusting, supportive collegiality. Consistencies and inconsistencies were again noted within these themes.

Principals reported the need for involvement of key leaders to facilitate, direct, guide, encourage, and/or support collaboration. However, these key leaders were identified differently across schools. They included a variety of people in different positions such as teachers, guidance counselors, instructional coaches, assistant principals, principals, personnel from the district office, and/or different combinations of these people. Strong leadership is necessary for all four key components of teacher collaboration. The literature reviewed in chapter 2 noted successful collaboration teams as having received frequent feedback from their administrators. While other structures can be put in place to provide leadership and effective facilitation of teacher



collaboration, the principal and/or assistant principal should also be consistently involved.

Principals continued to report about the need for time, which became the second theme that emerged as a factor that facilitated teacher collaboration. Intentionally scheduled job-embedded time to collaborate and having enough time to complete the necessary tasks within the meetings were commonly noted as factors that facilitated collaboration. This collaboration time looked very different across schools, however. The time was noted as being before school, after school, during teacher common prep times, built within the schedule, and/or the school not even having scheduled “mandated” collaboration times. The literature reviewed in this study described teacher collaboration time as being 40-90 minutes at least one time each week. There is a need for schools to schedule this time consistently within the school building and in such a way that the leadership can be involved so that frequent, timely feedback can be given.

No clear inconsistencies were noted within the final emergent theme of trusting, supportive collegiality. Principals commonly reported that relationships of trust, openness, honesty, a willingness to support each other, a family feel, and peer reinforcement facilitated collaboration. HO<sub>4</sub>, HO<sub>6</sub>, and HO<sub>7</sub> all tested predictive relationships of teachers working together and student achievement. All three of these null hypotheses were rejected, and significant predictive relationships were found. Personalities were noted as a factor that impeded collaboration, while trusting, supportive collegiality was noted as a factor that facilitated it. As previously mentioned, the

qualitative data collected from the principals suggested that having even just a few negative or difficult personalities on teacher teams can impede progress for the school.

*Research Question 7: What relationship do principals perceive exists between the quality/extent of collaboration and student achievement?*

Principals commonly reported that teacher collaboration directly correlated with student achievement. Moreover, the general theme from their comments was that collaboration and student achievement were highly correlated in that the more the teachers collaborated and the more effective they were at collaboration, the more learning increased. There were inconsistencies, however, in how principals defined student achievement and/or student learning. Many did not define it, while some defined it as increased assessment data. Assessments noted were varied. Principals at schools with lower grades as well as those who were at schools with higher grades said that collaboration enhanced student achievement, but their descriptions of what teacher collaboration entailed were very different, and their definitions of student achievement were either missing or greatly varied.

*Research Question 8: To what extent do themes generated from responses to the open-ended questions help inform the measured relationship between principal perceptions of teacher collaboration in their schools and student achievement?*

The answer to the final research question provides a summary to the study. Each of the hypotheses tested were further supported by the qualitative data collected from the

open-ended questions on the survey. This qualitative data generated additional information that brought more meaning to the quantitative results.

No significant predictive relationships were found between the presence of the first three identified key components of teacher collaboration and student achievement. The researcher failed to reject  $HO_1$ ,  $HO_2$ , and  $HO_3$ . Nearly all principals reported that these components were present in their school regardless of having a higher or lower Indiana “A-F” Accountability Model grade. Similarly, nearly all principals reported the fourth key component of collaboration being present at their school. While a significant predictive relationship was found between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model ( $HO_4$ ), the correlation was low. Finding significance in the predictive relationship between teacher teams working interdependently and student achievement meant that while the correlation was low, it did not merely happen by chance. Further understanding of principals’ ratings on the effectiveness of these components and their descriptions of teacher collaboration at their schools became even more important to the study. Additionally, all three hypothesis tests on the effectiveness components ( $HO_5$ ,  $HO_6$ , and  $HO_7$ ) showed low correlations in the predictive relationship while finding statistical significance, meaning the correlations were all certainly different from zero. Further understanding of principals’ descriptions of teacher collaboration at their schools became even more important to the study.

Principals’ descriptions of time spent on collaboration brought more insight to results of the test for  $HO_1$ , which found no statistically significant predictive relationship

between principal ratings on the presence of job-embedded collaboration time and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data revealed great differences in terms of duration and frequency of this time. Similar to prior studies on professional learning communities and teacher collaboration, this study found that the terms professional learning communities or teacher collaboration teams meant very different things to different schools. Varied descriptions of topics for teacher collaboration brought more insight to results of the test for HO<sub>2</sub>, which found no statistically significant predictive relationship between principal ratings on the presence of common goals and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data revealed great differences in terms of specific, common goals being discussed frequently related to student achievement versus defining other common outcomes such as professional development or school-wide event planning. These descriptions of varied collaboration topics also brought deeper understanding to the results of the test for HO<sub>3</sub>, which found no statistically significant predictive relationship between principal ratings on the presence of results orientation and student achievement as measured by the Indiana “A-F” Accountability Model. While nearly all principals noted this component was present in their schools, qualitative data again revealed great differences in terms of the results teacher teams were trying to achieve during collaboration time (i.e., topics based on student achievement, book studies, teacher planning, event planning, etc.).

The qualitative data revealed that while nearly all principals reported the four key components of collaboration being present in their schools, their collaboration was carried out with different structures, topics of focus, duration of time, and frequency of meetings across different schools. Moreover, varied structures for collaboration were reported in different schools, including the 8 Step Process, PLCs as defined and trained by Richard and Becky DuFour, administrators driving their own process, teachers driving their own process, committees driving the process, processes based on a rotation of topics such as student needs and professional development, and processes driven by NCA and TAP (acronyms not defined).

The test for HO<sub>4</sub> found a statistically significant relationship between principal ratings on the presence of teacher collaboration teams working interdependently and student achievement as measured by the Indiana “A-F” Accountability Model. The test for HO<sub>6</sub> found a statistically significant relationship between principal ratings on the effectiveness of trusting, supportive collegiality and student achievement as measured by the Indiana “A-F” Accountability Model. Additionally, the test for HO<sub>7</sub> found a statistically significant relationship between principal ratings on the effectiveness of sharing resources and practices and student achievement as measured by the Indiana “A-F” Accountability Model. While the correlations were low for these predictive tests, they provide evidence that teachers working interdependently affect student achievement. Furthermore, the qualitative data collected from the principals suggests that having even just a few negative or difficult personalities on teacher teams can impede progress for the school.

Finally, the test for  $H_{O5}$  found a statistically significant relationship between principal ratings on the effectiveness of developing and monitoring specific goals and student achievement as measured by the Indiana “A-F” Accountability Model. However, the correlation was low. The qualitative data again revealed that schools were developing and monitoring very different goals and outcomes for their collaboration meetings. Teams having common goals focusing on student achievement are likely to produce student achievement data that is very different from teams with focusing on other common goals, such as event planning or the latest book study. While the general theme from principals’ comments was that collaboration and student achievement were highly correlated in that the more teachers collaborated and the more effective they were at collaboration, the more learning increased, there were inconsistencies in how principals defined student achievement and/or student learning. Many did not define it, while some defined it as increased assessment data. Assessments noted were varied. Principals at schools with lower grades as well as those who were at schools with higher grades said that collaboration enhanced student achievement, but their descriptions of what teacher collaboration entailed were very different, and their definitions of student achievement were either missing or greatly varied. This explains the overall low correlation within the population sample, which included a rare study of wide spread data on teacher collaboration and its relationship to student achievement.

#### *The Instrument Developed in this Study*

This study developed an instrument to measure the four key components of collaboration based on essential elements identified in the literature. All survey items

were designed by the researcher and analyzed for content and clarity by a panel of reviewers with experience in educational leadership and survey development. This review and analysis was important for improving the questions, format, scales, and validity of the instrument. Revisions were made based on feedback from the panel. Two versions of the instrument are available in the Appendices. Appendix B includes the original instrument, which measures all items identified in the literature that make up the four key components of collaboration. Cronbach's Alpha was used to test the internal consistency of the original instrument, and it was found to be a reliable and valid measurement tool at  $\alpha = .924$ . The revised version of the instrument can be found in Appendix C. The revised version measures the three derived factors from the study, all of which were identified as significant predictors of student achievement. The revised version of the instrument in Appendix C is recommended to help researchers and school leaders assess the presence and effectiveness of these three key factors of teacher collaboration in their schools. Cronbach's Alpha was used to test the internal consistency of the revised instrument, and it was found to be a reliable and valid measurement tool at  $\alpha = .935$ .

#### *Recommendations for Future Research*

Recommendations for future research on the topic of teacher collaboration are as follows:

1. Multiple structures and processes were reported by principals to describe teacher collaboration at their schools. Some of these processes included clearly defined, published descriptions of teacher collaboration such as the 8 Step Process or

Professional Learning Communities as defined by Richard and Becky DuFour.

Future studies of schools using specific processes for collaboration and how those processes carry out the four identified key components of collaboration may provide further understanding of how the components can be consistently implemented.

2. In addition to the previous recommendation, future studies of schools observed using different processes and how those specific processes relate to student achievement may yield different correlations than what were found in this study.
3. A deeper, more common understanding of what constitutes student achievement is necessary. Principals defined student achievement in various ways, and some did not define it at all. Qualitative studies of multiple stakeholders in school communities may help further define a common language for student achievement.
4. Additional qualitative studies of how “A” schools carry out the four components of teacher collaboration may also provide further examples of how they can be implemented. It may also be interesting to see if there are similarities and/or differences in the implementation of the four key components of collaboration between “A” schools and “F” schools.
5. Future research of schools using the instrument developed in this study to accurately assess and improve teacher collaboration may further enhance leadership capacity to increase the effectiveness of their collaboration teams and evaluate the instrument’s usability in the field.



### *Limitations*

While the sample for the study was large (359 principals), just over 26% of the total population (1,366 principals) for the study participated. Therefore, the results may not give full representation of all elementary and middle schools in Indiana.

Additionally, some principals choosing to participate in the study may or may not have been present in their schools during the year measured by the Indiana “A-F”

Accountability Model (2012). For that reason, the researcher checked the data with the most recent Indiana “A-F” grades (2013) which were released just after chapter 4 of this study had been completed. The same results were identified when informally running the hypotheses tests with that data, but the researcher chose to report the study based on the data it was originally intended to report.

### *Conclusion*

Researchers and educational leaders can build upon these descriptions of the four key components of teacher collaboration and how they relate to student achievement.

The literature reviewed and the participants of this study reinforced that schools functioning with teacher collaboration teams experience gains desired for their children and the improvement in student achievement data. However, the literature noted much ambiguity in the meaning of professional learning communities or teacher collaboration teams among schools, and that lack of a commonly defined collaborative practice also emerged from qualitative data gathered from principals in this study.

Bringing specificity to the collaborative practice by clearly defining student achievement, setting common goals that focus on that achievement, moving forward with a results orientation, and working interdependently during job-embedded collaboration time remains a must do for school leaders. The instrument developed in this study can assist school leaders in assessing the collaborative process in their schools. Based on that assessment, supporting teacher collaboration teams with real, actionable advice will enable more educators to work in productive collaboration teams and accomplish higher, faster results than they could ever do alone behind a closed classroom door.

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## APPENDICES

Appendix A  
Teacher Collaboration Survey

Dear Principal,

I am the principal at Sugar Grove Elementary in Greenwood, Indiana. I am a doctoral candidate at Purdue University-West Lafayette. Dr. Marilyn Hirth is my major professor and is guiding my research. I am requesting your help in completing my dissertation by allowing me to study your perceptions of teacher collaboration. More precisely, I am interested in your thoughts and beliefs regarding the presence and effectiveness of key components of teacher collaboration in your school.

This study is supported by the Indiana Association of Public School Superintendents as well as the Indiana Association of School Principals. It will develop an instrument that can be further refined for principals to assess the climate of teacher collaboration in their schools, and thus, evaluate the implications for further professional development. I am asking you to complete an on-line survey consisting of 34 questions, which should take 15 minutes of your time. Please know that your answers to these questions are valuable and will contribute to the results. All data will be confidential and reported out as a total quantity. No principals or schools will be named in any reports on the research.

If you have any questions regarding the survey or the study, please contact me by email or by phone. Questions about the study in general may be directed toward my research supervisor, Dr. Marilyn Hirth, at 765-494-0319.

I very much appreciate your time and effort in completing this survey.

Thank you,

Davin E. Harpe  
[धारpe@purdue.edu](mailto:धारpe@purdue.edu)  
317-716-2446

Dr. Marilyn Hirth  
Associate Professor of Educational Studies Purdue University  
[mahirth@purdue.edu](mailto:mahirth@purdue.edu)

This survey has 3 sections. Its purpose is to gain an understanding of your perspective of the presence and effectiveness of four key components of teacher collaboration in your school. Section 1 asks two questions regarding background information, which will remain confidential. Section 2 asks questions about the presence and effectiveness of the collaboration components at your school. Section 3 contains four optional, open-ended questions.

**Section 1: Background Information**

In the space below, please type the name of the school where you serve as the principal. You and your school will not be identified in the study.

Including this year, how many years have you been the principal at your current school?

- 0-1 Year
- 2-3 Years
- 4-5 Years
- 6-10 Years
- 11-20 Years
- Over 20 Years

## Section 2: Key Components of Teacher Collaboration

### Collaboration Component 1: Job-Embedded Collaboration Time

Note: This study recognizes collaboration time as an intentionally scheduled, on-going cycle of teachers working together to promote student academic growth. Collaboration time with this purpose may include (but is not limited to) late-arrival or early-release day meetings, staff meetings held for collaboration, team meetings, department meetings, etc.

Do teachers at your school have regularly scheduled collaboration times?

- Yes
- No

Do teachers at your school have regularly specified meeting locations?

- Yes
- No

About how many minutes each week do teachers at your school collaborate during a structured meeting time?

- Less than 20
- 20-29
- 30-39
- 40-49
- 50-59
- 60 or more

About how many minutes each month do teachers at your school collaborate during a structured meeting time?

- Less than 20
- 20-59
- 60-89
- 90-119
- 120-149
- 150 or more

How would you rate teacher teams/grade levels at your school on utilization of job-embedded collaboration time?

- Highly Effective
- Effective
- Improvement Necessary
- Ineffective
- Not Present

For the remaining questions in Section 2, please rate the presence of each described criterion on the left side, and on the right side rate how effective teacher teams are in performing that described criterion at your school. If the described criterion is not present at your school, please select "No" on the left side and "Not Applicable" on the right side. While some teacher teams may be more effective at the described criterion than other teams, please rate these items based on your overall perception of practice at your school.











**Section 3 (Optional):** Section 3 includes four open-ended questions. These questions are optional. Please briefly express your thoughts. You can answer these questions in one or two sentences.

Please briefly describe the teacher collaboration process at your school.

What factors impede effective teacher collaboration in your school?

What factors facilitate effective teacher collaboration in your school?

Describe the relationship between teacher collaboration and student learning at your school.

Appendix B  
The Original Instrument

## Teacher Collaboration Survey

### Key Components of Teacher Collaboration

#### Collaboration Component 1: Job-Embedded Collaboration Time

Note: This instrument recognizes collaboration time as an intentionally scheduled, on-going cycle of teachers working together to promote student academic growth. Collaboration time with this purpose may include (but is not limited to) late-arrival or early-release day meetings, staff meetings held for collaboration, team meetings, department meetings, etc.

- 1) Do teachers at your school have regularly scheduled collaboration times (i.e., daily, weekly, bi-weekly, and/or monthly).

Yes	No
-----	----

- 2) Do teacher teams/grade levels at your school have regularly specified meeting locations.

Yes	No
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- 3) About how many minutes each week do teachers at your school collaborate during a structured meeting time?

Less than 20	20-29	30-39	40-49	50-59	60 or More
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- 4) About how many minutes each month do teachers at your school collaborate during a structured meeting time?

Less than 20	20-59	60-89	90-119	120-149	150 or More
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- 5) How would you rate teacher teams/grade levels at your school on utilization of job-embedded collaboration time?

Highly Effective	Effective	Needs Improvement	Ineffective	Not Present
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For the remaining questions in Section 2, please rate the presence of each described criterion on the left side, and on the right side rate how effective teacher teams are in performing that described criterion at your school. If the described criterion is not present at your school, please select “No” on the left side and “Not Applicable” on the right side. While some teacher teams may be more effective at the described criterion than other teams, please rate these items based on your overall perception of practice at your school.

Collaboration Component 2: Common Goals							
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?				
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)
Yes	No	6) discuss common learning challenges for their students.	HE	E	IN	IE	NA
Yes	No	7) discuss shared outcomes for what they want their students to learn.	HE	E	IN	IE	NA
Yes	No	8) develop specific and measurable goals for student achievement.	HE	E	IN	IE	NA
Yes	No	9) collectively develop instructional strategies.	HE	E	IN	IE	NA
Yes	No	10) collectively analyze common assessments.	HE	E	IN	IE	NA

Collaboration Component 3: Results Orientation								
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?					
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable(NA)	
Yes	No	11) have discussions based on student needs and accountability measures (i.e., data-directed dialogue).	HE	E	IN	IE	NA	
Yes	No	12) monitor student progress with learning evidence or data.	HE	E	IN	IE	NA	
Yes	No	13) develop specific and measurable goals for student achievement.	HE	E	IN	IE	NA	
Yes	No	14) adjust their instruction to increase achievement as a result of their collaboration.	HE	E	IN	IE	NA	
Yes	No	15) share instructional resources.	HE	E	IN	IE	NA	
Yes	No	16) frequently celebrate progress made by their team and/or students.	HE	E	IN	IE	NA	
Yes	No	17) make actionable responses based on their collaboration.	HE	E	IN	IE	NA	
Yes	No	18) are accountable to their teammates.	HE	E	IN	IE	NA	
Yes	No	19) embrace district and state accountability.	HE	E	IN	IE	NA	
Yes	No	20) focus more on learning and less on site-based governance issues.	HE	E	IN	IE	NA	

Collaboration Component 4: Working Interdependently								
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?					
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)	
Yes	No	21) have established trust in each other.	HE	E	IN	IE	NA	
Yes	No	22) support and rely on each other.	HE	E	IN	IE	NA	
Yes	No	23) share teaching practices.	HE	E	IN	IE	NA	
Yes	No	24) coach and encourage each other.	HE	E	IN	IE	NA	
Yes	No	25) share their weaknesses with each other.	HE	E	IN	IE	NA	
Yes	No	26) face difficult work with can-do attitudes.	HE	E	IN	IE	NA	
Yes	No	27) invite feedback from their peers.	HE	E	IN	IE	NA	
Yes	No	28) The principal and/or assistant principal at our school gives teacher teams/grade levels frequent feedback on their collaboration.	HE	E	IN	IE	NA	



Appendix C  
The Revised Instrument

## Teacher Collaboration Key Factors Survey

### Key Factors of Teacher Collaboration

The survey begins on the next page. Please rate the presence of each described criterion on the left side, and on the right side rate how effective teacher teams are in performing that described criterion at your school. If the described criterion is not present at your school, please select “No” on the left side and “Not Applicable” on the right side. While some teacher teams may be more effective at the described criterion than other teams, please rate these items based on your overall perception of practice at your school.

Note: This instrument recognizes collaboration time as an intentionally scheduled, on-going cycle of teachers working together to promote student academic growth. Collaboration time with this purpose may include (but is not limited to) late-arrival or early-release day meetings, staff meetings held for collaboration, team meetings, department meetings, etc.

Collaboration Factor 1: Developing and Monitoring Specific Goals								
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?					
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)	
Yes	No	1) develop specific and measurable goals for student achievement.	HE	E	IN	IE	NA	
Yes	No	2) monitor student progress with learning evidence or data.	HE	E	IN	IE	NA	
Yes	No	3) discuss shared outcomes for what they want their students to learn.	HE	E	IN	IE	NA	
Yes	No	4) collectively analyze common assessments.	HE	E	IN	IE	NA	
Yes	No	5) have discussions based on student needs and accountability measures (i.e., data-directed dialogue).	HE	E	IN	IE	NA	
Yes	No	6) make actionable responses based on their collaboration.	HE	E	IN	IE	NA	
Yes	No	7) discuss common learning challenges for their students.	HE	E	IN	IE	NA	
Yes	No	8) The principal and/or assistant principal at our school gives teacher teams/grade levels frequent feedback on their collaboration.	HE	E	IN	IE	NA	
Yes	No	9) utilize job-embedded collaboration time.	HE	E	IN	IE	NA	
Yes	No	10) adjust their instruction to increase achievement as a result of their collaboration.	HE	E	IN	IE	NA	

Collaboration Factor 2: Trusting, Supportive Collegiality							
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?				
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)
Yes	No	11) have established trust in each other.	HE	E	IN	IE	NA
Yes	No	12) support and rely on each other.	HE	E	IN	IE	NA
Yes	No	13) coach and encourage each other.	HE	E	IN	IE	NA
Yes	No	14) share their weaknesses with each other.	HE	E	IN	IE	NA
Yes	No	15) invite feedback from their peers.	HE	E	IN	IE	NA
Yes	No	16) face difficult work with can-do attitudes.	HE	E	IN	IE	NA

Collaboration Factor 3: Sharing Instructional Resources and Practices							
The described criterion is present at your school.		Criterion of Component	How effective are teacher teams in performing the described criterion?				
Yes	No	Teacher teams/grade levels at our school:	Highly Effective (HE)	Effective (E)	Improvement Necessary (IN)	Ineffective (IE)	Not Applicable (NA)
Yes	No	17) share instructional resources.	HE	E	IN	IE	NA
Yes	No	18) share teaching practices.	HE	E	IN	IE	NA

VITA

## VITA

**DAVIN E. HARPE****EDUCATION**

- 2014           Purdue University, West Lafayette, Indiana  
PhD Educational Leadership
- 2002           Ball State University, Muncie, Indiana  
MAE Educational Administration and Supervision
- 1999           Indiana University, Bloomington, Indiana  
BS Elementary Education

**SCHOOL ADMINISTRATION EXPERIENCE**

- 2013 – Present           Principal – Sugar Grove Elementary  
Center Grove Community School Corporation  
Greenwood, Indiana
- 2011 – 2013           Principal – Cardinal Elementary  
Brownsburg Community School Corporation  
Brownsburg, Indiana
- 2007 – 2011           Principal – South Creek Elementary  
Franklin Township Community School Corporation  
Indianapolis, Indiana
- 2005 – 2007           Principal – Parkside Elementary  
Bartholomew Consolidated School Corporation  
Columbus, Indiana
- 2004 – 2005           Assistant Principal – Hoosier Road Elementary  
Hamilton Southeastern Schools  
Fishers, Indiana

**TEACHING EXPERIENCE**

- 2004 – 2005                      Fourth Grade Teacher – Hoosier Road Elementary  
Hamilton Southeastern Schools  
Fishers, Indiana
- 2003 – 2004                      Third Grade Teacher – Harrison Parkway Elementary  
Hamilton Southeastern Schools  
Fishers, Indiana
- 2001 – 2003                      Second Grade Teacher – Harrison Parkway Elementary  
Hamilton Southeastern Schools  
Fishers, Indiana
- 2000 – 2001                      First Grade Teacher – Harrison Parkway Elementary  
Hamilton Southeastern Schools  
Fishers, Indiana
- 1999 – 2000                      Second Grade Teacher – Granville Wells Elementary  
Western Boone Community School Corporation  
Thorntown, Indiana