A Study of the Implementation of Professional Learning Community Practices and Their Relationship to Teacher Practices and Student Learning Outcomes

by

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Abstract

The present study was designed to examine the PLC elements identified by the leadership team at Angel Primary School. The three features of the school's implemented innovation were common formative assessment, the school's collaboration plan and differentiated instruction. The data collection instruments allowed participants (n = 18) to indicate their perceptions and give detailed descriptions of how school-wide implementation of the PLC practices of Common Formative Assessment, the Collaboration Plan, and Differentiated Instruction had developed during the implementation year. This mixed-methods research study used data generated by the Angel Primary School Professional Learning Communities (PLC) Survey, the Stages of Concern Questionnaire (SoCQ), the Fountas and Pinnell Benchmark Assessment System (BAS), interviews, and additional documents and artifacts. Outcomes of the study included: facilitators and hindrances of implementation as measured by the Angel Primary School PLC Survey, teacher instructional change as measured by the SoCQ, and student learning outcomes as measured by the BAS. The framework of the case study was based on the five attributes of PLCs identified through the work of Shirley M. Hord (1997, 2004): 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions.

The Angel Primary School PLC Survey was strongly aligned with the Hord (1997) framework presented above. The survey addressed six principles in all which included each of the five individual principles in the Hord (1997, 2004) framework with the principle Supportive

Conditions being divided into Supportive Conditions-Relationships and Supportive Conditions-Structures. Comparison of the Angel Primary School PLC Survey beginning of year data to the data collected at the end of the year culminated in PLC had improvement from the beginning of the year to the end of the year in all six principles addressed by the survey. Four of the six principles; Shared and Supportive Leadership, Shared Personal Practice, Supportive Conditions-Relationships, and Supportive Conditions-Structures experienced significant change.

The analysis of data revealed a number of factors that facilitated the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction. Evidence of facilitative factors was identified in relation to each of the four principles addressed by the Angel Primary School PLC Survey experiencing significant change. Facilitative factors to the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction included; high expectations from school leadership, strong leadership support, teacher autonomy, teacher empowerment, encouraged risk taking, leadership focus on collaboration, collaboration focused on improved instruction and student learning outcomes, opportunities for teachers to apply their own learning and to share results, an overall supportive school culture, adequate resource personnel, effective communication systems, and professional development opportunities . The greatest hindrance to the implementation process identified through the analysis of data was the amount of time necessary for full implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction with fidelity across the entire school.

The SoCQ results of both the pre- and post-test indicated participants still had a great need for additional information pertaining to PLC implementation of common formative assessment, the collaboration plan and differentiated instruction. Results of the SoCQ also

suggested that teachers needed more information related to how the implementation will affect them personal and professionally.

Kindergarten student learning data from the beginning of the year administration of the BAS was compared with data from the end of the year administration during the both the 2012/2013 and 2013/2014 school years. Significant change did occur from the beginning of the year to the end of the year for both school years. First grade student learning data from the beginning of the year administration of the BAS was also compared with data from the end of the year administration during the both the 2012/2013 and 2013/2014 school years. Significant change did occur from the beginning of the year to the end of the year for both school years at this grade level as well.

Results suggested that if the PLC practices of Common Formative Assessment, Collaboration, and Differentiated Instruction are applied consistently, student achievement will increase regardless of the staff's personal feelings and concerns about the model. One important implication for action is to apply what was learned about factors that hindered the implementation of the PLC practices and to identify and implement solutions to those problems.

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CHAPTER 1. OVERVIEW OF THE STUDY

Introduction

Research supports the idea that the effectiveness of the classroom teacher and the daily instructional and curricular decisions made by teachers at the classroom level significantly affect student learning (McCaffrey, Lockwood, Koretz, Louis, & Hamilton, 2004; Sanders & Rivers, 1996; Sanders, Wright, & Horn, 1997; Wenglinsky, 2002). Therefore, teachers must receive the support, help, and resources necessary to improve their instructional practices and the instructional decisions they make every day.

There is strong evidence that professional development is required to help teachers enhance and change their instructional practices and equip them to make sound instructional decisions to meet the needs of the diverse student populations found in today's classrooms (Vescio, Ross, & Adams, 2008b). In order to be effective, professional development must focus on the acquisition of new knowledge and support the application of that knowledge in the classroom rather than simply provide teachers with one shot sit-and-get workshops, so commonly used in the past (Vescio et al., 2008b). Professional development must also cultivate collaboration among teachers as they determine what to teach, how to teach, how to assess, and how to adjust instruction for intervention purposes (Vescio et al., 2008b).

In the last fifteen years, a paradigm shift has occurred in regards to the philosophical, conceptual, and structural frameworks of professional development. The new paradigm is based on shared public process; sustained interaction; emphasis on substantive, school-related issues;

reliance on internal expertise; expectations of teachers as active participants; emphasis on the why and how of teaching; a theoretical research base; and the understanding that lasting change takes place through a slow process ((Newmann, King, & Youngs, 2000). In response to this new view of professional learning, the Professional Learning Community (PLC) model has emerged in support of teacher acquisition of new knowledge, as well as the development and implementation of new assessments and improved instructional practices in the classroom through the process of collective inquiry (DuFour, DuFour, Eaker, & Many, 2006). The educational community and educational leaders have debated about how to bring learning experiences to teachers that are powerful enough to change their instructional practice and bring about school reform (Putnam & Borko, 1997). Collaborative routines are an important component in achieving increased student achievement. Collaborative practices of this nature have been described in various ways but are most often described as Networked Communities or Professional Learning Communities (PLC's) (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006). Thus, evidence suggests that the PLC model can be a vehicle to ensure that professionals are given opportunities to learn new practices and to generate new knowledge supporting positive school change.

School accreditation agencies are beginning to recognize the importance of PLCs in continuous school improvement as schools process. In April 2006, the North Central Association Commission on Accreditation and School Improvement (NCA CASI), the Southern Association of Colleges and Schools Council on Accreditation and School Improvement (SACS CASI), and the National Study of School Evaluation (NSSE) came together to form one strong and unified organization under the name AdvancED. The AdvancED Accreditation Process is a clear and comprehensive program of evaluation and external review, supported by research-based

standards, and dedicated to helping schools, districts, and education providers continuously improve. The accreditation process conducted by AdvancEd is composed of Seven Accreditation Standards for Quality School Systems:

- Standard 1: Vision and Purpose
- Standard 2: Governance and Leadership
- Standard 3: Teaching and Learning
- Standard 4: Documenting and Using Results
- Standard 5: Resources and Support Systems
- Standard 6: Stakeholder Communication and Relationships
- Standard 7: Commitment to Continuous Improvement

The development of the Seven Accreditation Standards for Effective Schools and School Systems was based on research conducted by the National Study of School Evaluation (Kuh, 2003). The NSSE research indicates that a school or school district seeking to improve student achievement needs to focus on three core tasks:

- Ensure Desired Results – by expecting results and monitoring performance toward achieving desired results.
- Improve Teaching and Learning – by supporting students in their learning and maximizing teacher effectiveness.
- Foster a Culture of Improvement – by developing a learning community and leading for improvement.

The effective practices contributing to each of the three core tasks identified by NSSE are powerful levers for improving student achievement and are closely aligned with the framework that is the basis for this study. The five attributes of PLCs identified by Hord (1997; 2004) are:

1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions. All of the schools within the Federal Education Organization are accredited through the AdvancEd accreditation process. Each individual school is on a five-year accreditation cycle. The accreditation status of each district and the Federal Education Organization as a whole is determined by the accreditation status of the individual schools.

Background of Professional Learning Community Implementation at Angel Primary School

Angel Primary School was built in 1973 and is located on an U. S. Army instillation in Alabama.. Students who are enrolled at Angel Primary School are dependents of military personnel. Angel Primary School is part of a district that includes schools located on military instillations in both Georgia and Alabama. All the schools in this district, as well as other districts serving students of active duty military members across the United States and abroad, operate under the policies and procedures of an education organization located in Arlington, VA. Angel Primary School houses early intervention/special needs three year olds through regular education first grade students.

Based on the five-year accreditation cycle implemented by the education organization of which Angel Primary School is a part, the school was going to go through its Quality Assurance Review (QAR) and accreditation visit during the 2010–2011 school year. The purpose of the QAR is to evaluate the school's adherence to the AdvancEd continuous school improvement standards, assess the effectiveness of the school's improvement efforts, review performance results, and how results are used to inform improvement efforts, provide high-quality feedback with clear recommendations for next steps, and to make an accreditation recommendation. At

the beginning of the 2010–2011 school year, Angel Primary School began the school improvement process based on AdvancEd's Five Standards for Continuous School improvement. School administrators and Continuous School Improvement (CSI) chairpersons were trained in the implementation of the AdvancEd school improvement process and in the collection of evidence reflective of each of the seven school improvement standards: 1) Vision and Purpose, 2) Governance and Leadership, 3) Teaching and Learning, 4) Documenting and Using Results, 5) Resources and Support Systems, 6) Stakeholder Communication and Relationships, and 7) Commitment to Continuous Improvement. Angel Primary School CSI chair and administrator began to work with the whole staff concerning the Continuous School Improvement Plan. The CSI chair and administrator led the staff through making the commitment, collecting and analyzing existing school and student achievement data, developing a mission and goals, developing the school improvement plan, implementing the school improvement plan, and monitoring and documenting plan implementation. In the 2010–2011 school year, Angel Primary School conducted its Quality Assurance Review (QAR) visit with AdvancEd. Angel Primary School came through the review with flying colors, receiving full accreditation with two commendations. However, the AdvancEd QAR team did identify two areas they classified as Required Actions. One Required Action was as follows:

> Collaborate as Professional Learning Communities to implement a systematic process to analyze data for the purpose of identifying new interventions and future goals. Use research-based best practices to increase rigor and student engagement. The team noted that the school currently provides staff development time that could focus on selecting assessment measures that are valid and reliable and then analyzing the test results; however, there isn't adequate evidence that collaboration of this type is occurring. The

> school must develop and implement a plan to collaborate as teams both vertically and horizontally. Formative and summative assessments should be administered with fidelity and consistency by all staff to ensure that the results are comparable and objective. As needs are identified, based on student performance, it will be necessary to match appropriate interventions to the expected achievement outcome. Ensure that designated learning time is utilized to the fullest extent. Emphasize maximum use of instructional minutes on a daily basis. (AdvancEd Report of Quality Assurance Review, 2011, p. 6–7)

At the end of the 2010–2011 school year funding and support was allocated by the education activity that enabled every school, stateside and abroad, to form and implement a Professional Learning Community (PLC). The PLCs were to use data to determine an area of need specific to their school and to develop or adopt an innovation that would support progress in the school's Continuous School Improvement Plan. The PLC at Angel Primary School made the decision to develop an innovation that would address the areas in need of improvement identified in the Required Action by the AdvancEd QAR team in the during the 2010–2011 accreditation visit.

Three to five members were selected to participate in each PLC through an application process. One team member was selected to facilitate training and the work of the team throughout the 2011–2012 school year. Weeklong training sessions were held in each district for team facilitators.

After their training, the facilitators returned to their schools and conducted a five day training session with all PLC members from their schools. An additional requirement was that the team be given release time from their assigned classroom duties for a total of two 8-hour work days during the 2011–2012 school year. This release time was to be used for meetings in

which PLCs would develop the innovation each PLC elected to implement in their schools, and to monitor the implementation process. Teams were given the freedom to determine the number and length of each meeting as long as the total time in meetings during the school year totaled 16 hours. The Angel Primary School PLC elected to have four half-day meetings in order to assess progress quarterly.

During the summer week-long training, the PLC designed materials and instruments necessary to implement three new practices at Angel Primary School: a Common Formative Assessment, Collaboration Plan, and Differentiated Instruction.

The Common Formative Assessment

The assessment was designed to be administered five times during the school year and to assess six components of reading comprehension. The components of comprehension that are addressed by the Common Formative Assessment are sequencing, character, setting, problem, solution, and inferring. An administration of the Common Formative assessment would begin by having the student read a book at an appropriate level of difficulty for the student's grade level at the time of the year the administration was taking place. For Kindergarten, the book used for the first administration would be a level A, a level A would also be used for the second administration of the Common Formative Assessment, a level B book would be used for the third and fourth administration, and a level C book would be used for the fifth administration. For First Grade a level C book would be used for the first administration, a level E would be used for the second administration, a level F would be used for the third administration, a level H would be used for the fourth administration, and a level I book would be used for the final administration of the Common Formative Assessment at the end of the year. These levels were based on the Fountas and Pinnell guided reading levels.

Once the student has read the book aloud, they are asked to retell everything they can remember about the story from the beginning to the end. The teacher makes notes throughout the retelling then scores the student's retelling and ability to sequence using a four-point rubric. When the retelling is complete the teacher asks questions pertaining to five components of comprehension; character, setting, problem, solution, and inferring. The teacher uses a four-point rubric to score the level of information the student is able to give pertaining to each individual component. Data generated by the administration of the Common Formative Assessment allows teachers to identify which specific components of comprehension may be a weakness for each individual student and which components are an area of strength.

The Collaboration Plan

The Collaboration Plan was built around a monthly Collaboration Calendar and the use of a Collaboration Meeting Minutes Template. Each Wednesday the students at Angel Primary School were released at 1:45 rather than at 3:00. These early release days were designated to provide teacher with specific training and opportunities to collaborate. The Collaboration Calendar provided a monthly schedule indicating the type of collaboration that would take place each Wednesday afternoon during early release throughout each month. The first Wednesday of each month was dedicated to vertical collaboration. This was when teachers from each grade level had the opportunity to collaborate and plan with teachers from the grade levels above and below their own. The focus of this vertical collaboration was on the sharing of student work and the analysis of student learning data. Teachers from the preceding grade level gained new knowledge about what they can do to better prepare their students for the next grade level and can see first-hand the expectations their students will face the following year. Collaborating teachers also shared ideas and strategies that support improved instructional practices. On the

second Wednesday of each month, teachers collaborated horizontally with other teachers from the same grade level. The focus of this horizontal collaboration was also on sharing student work, analyzing student learning data, sharing ideas pertaining to instruction, sharing results of instruction, and sharing strategies for improving instructional practice. In addition, teachers used these horizontal collaboration opportunities to identify and discuss specific student needs identified in the student learning data, planning instruction to meet student learning needs, and to identify areas of weakness and areas of strength across the grade level. The third Wednesday of each month was dedicated to collaboration among teachers representative of each grade level, support personnel, and special area teachers. Each of these groups included at least one teacher from each grade level along with others such as the guidance counselor, media specialist, P.E. teacher, music teacher, speech pathologist, Special Education teacher, reading remediation teachers, Spanish teacher, school nurse, educational technologist, and the principal. The focus of this collaboration was on sharing student work and analyzing student learning data as well as planning methods through which the support personnel and specialists could work along-side the classroom teachers to support and assist in meeting student needs. The fourth Wednesday of each month was set aside for District-directed training and having the entire staff work on the Continuous School Improvement Process.

The Collaboration Meeting Minutes Template was developed by the Angel Primary School Continuous School Improvement Team and the school principal and was utilized at each collaboration session to collect evidence of what took place during the collaboration sessions. The template was available electronically to all collaboration groups. A designated collaboration group member was responsible for maintaining through the documentation of all discussions, presentations, and any planning that took place during the collaboration sessions. The template

provided a format for collecting evidence and information pertaining to student referrals for student support and special education services, student work samples, newly emerging student data and findings identified through analysis of the data, discussion of student needs, plans for differentiating instruction, strategies to improve instruction, results of instructional practices, and any new information related to instruction and student learning outcomes that may have emerged since the last collaboration session. When Collaboration Meeting Minutes Templates were completed they were saved as a protected file accessible only to collaboration group members and school leadership.

Differentiated Instruction

Differentiated instruction implemented at Angel Primary School was based predominately on research conducted by Tomlinson (1999) and Suban (2006). After each administration of the Common Formative Assessment, the Angel Primary School PLC used the Collaboration Calendar discussed above to take advantage of a variety of collaboration opportunities to analyze student learning data generated by the assessment and to plan instruction to meet the individual needs of all students. Using the Common Formative Assessment data, teachers were able to plan differentiated instruction for use with students having similar needs related to the six components of comprehension addressed by the assessment. For example, if through the Common Formative Assessment data the teacher was able to identify a group of students who scored low on the rubric when asked to tell about the problem of the story, the teacher would work with their collaboration groups to design instruction that would specifically and rigorously address that area of weakness and would later share with their collaboration groups the results of the differentiated instruction used to address this specific weakness. Through this process teachers were able to develop instruction to meet very specific student

needs, then were able to share the outcomes of this instructions and receive feedback that could be utilized to further refine the instruction if needed.

The Common Formative Assessment, Collaboration Plan, and Differentiated Instruction were implemented as a pilot in the classrooms of PLC members during the 2011–2012 school year. Students participating in the pilot showed progress in six components of reading comprehension, and as a result, district and school leadership wanted to implement the practices of the pilot study on a school-wide basis. This school-wide implementation process is the focus of this research project.

Background

> The new problem of change … is what would it take to make the educational system a learning organization, expert at dealing with change as a normal part of its work, not just in relation to the latest policy, but as a way of life. (Fullan, 1993, p. 4)

Educational transformation resulting in improved instructional practices and increased student achievement is the aim of every school district across the United States. With the nation's vision for 2020 being aimed towards two goals — 1) assuring that all high school graduates are prepared for an academic and professional future, and 2) ensuring greater success for low-income students and students of color — it is imperative that educational leaders make radical changes to teaching and learning practices in schools (Carroll, Fulton, & Doerr, 2010). Teachers continuing to work in isolation and attempting to meet the needs of the diverse student populations they currently teach is neither economically nor educationally sound in the 21st Century (Carroll et al., 2010).

A great deal of research and attention over the last few decades has been devoted to the investigation of PLCs (Saunders, Goldenberg, & Gallimore, 2009). Research reveals that

schools in which PLCs are fully implemented encourage teachers to improve their instructional practices and increase student learning outcomes. However, which components of practice implemented by the PLC have the greatest influence on positive school change and the degree to which the PLC is responsible for school effectiveness is not widely known (Saunders et al., 2009). In addition, there are few to no studies which focus on how to use PLCs to inspire change in primary schools. The literature suggests that further documentation of studies related to schools, and in particular primary schools in the Federal Education Organization in which Angel Primary School is housed, would be useful for the advancement of the current PLC research base as well as for Federal Education Organization schools.

Curiosity and interest in PLCs was sparked by Senge's reintroduction of "learning organizations" in his seminal book *The Fifth Discipline* in 1990. "The most successful corporation of the future will be a learning organization" (Senge, 1991, p. 4). A study conducted by Sigurðardóttir (2010) found that PLCs, when fully implemented, have the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning. PLCs are grounded in two assumptions. The first assumption is that knowledge is situated in the day-to-day lived experiences of the teacher and best understood through critical reflection with others who share the same experience; the second assumption is that actively engaging teachers in PLCs will increase their professional knowledge and enhance student learning (Sigurðardóttir, 2010).

Purpose of the Study

Teachers should have opportunities to participate in collective practices that equip them to model collaborative learning and the construction of knowledge that is central to expected competencies of the 21st Century. However, these opportunities are often not available, which

leads to fragmentation in their own instructional practices and failure to meet the needs of their students. It is known that by functioning as PLCs, teachers are able to bridge gaps between their instruction and student achievement, but the reality is that most teachers are still planning and teaching in isolation (Carroll et al., 2010).

This study was designed to investigate how teachers working within a Professional Learning Community (PLC) utilize the components and structure of the PLC to improve their instructional practices and ultimately increase student achievement. Facilitating and hindering factors to implementation of the PLC practices were used to describe the PLC as it developed during the implementation year.

There is now an urgent need for America's teachers to find ways to collectively build their personal knowledge, widely share this knowledge, and transform personal knowledge into cohesive professional knowledge among colleagues for the purpose of meeting the needs of all students. PLCs as a vehicle for change can make this possible (Chokshi & Fernandez, 2005; Vescio, Ross, & Adams, 2008a). In order for this to take place it is important to identify elements and practices that are commonly included in the PLC implementation process. This study also investigated the structures and processes of the PLC at Angel Primary School.

Conceptual Framework and Research Questions

The case study is based on the work of Shirley M. Hord's (1997, 2004) five attributes of PLCs: 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions.

1. **Supportive and Shared Leadership** – When leaders are supportive and share leadership responsibilities they plant the seeds of community and collaboration then nurture and protect the learning community as it grows (Hord, 2004).

2. **Shared Values and Vision** – Having shared values and a shared vision means there is a clear, mutual understanding of where the members of an organization desire the organization to ultimately be in the future and having knowledge of what it will take to get there (Hord, 2004).
3. **Collective Learning and the Application of Learning** – Collective Learning and Application of Learning is evident in schools when educators from all levels, subject areas, and departments work together to gain new knowledge that will promote student learning and highest student achievement (Hord, 2004).
4. **Shared Practice** – Shared personal practice is non-evaluative in nature, is based on a shared pursuit of individual and school improvement, and is only successful in a culture of trust and mutual respect (Hord, 2004; Kruse, Louis, & Bryk, 1994).
5. **Supportive Conditions** – Supportive Conditions determine when, where, and how school staffs collaborate for the purpose of making decisions, solving problems, and working creatively. This attribute has been defined as the most critical factor for school improvement because it provides the structures that sustains and supports the school vision and the functions of the learning community. Hord addressed two categories of supportive conditions: physical and structural conditions, and people capacities (Hord, 2004).

The research questions that guided this study were:

1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?

Significance of the Study

The study was designed to test the practices of effective PLCs. The researcher attempted to deepen the understanding of the relationship of PLC practices and student achievement. Although there is vast research related to educator participation in PLCs, there is little to no empirical evidence to suggest positive effects on teaching practices and student learning outcomes (Daly & Finnigan, 2010; Daly, Moolenaar, Bolivar, & Burke, 2010; de Lima, 2007; Earl & Katz, 2007; Hallinger, 2003; Hite, Hite, Mugimu, & Nsubuga, 2010; Hite, Williams, & Baugh, 2005; Moolenaar, Daly, & Sleegers, 2011; Moolenaar, Sleegers, & Daly, 2012; Pil & Leana, 2009; Veugelers & Zijlstra, 2002). Saunders, Goldenberg, and Gallimore (2009) reported that there were very few studies that measured the relationship of PLCs on student learning. Of 55 books, papers, and articles in U.S. literature from 1990–2005 using learning team-related search terms, 11 were empirical studies considering the impact of PLCs on teaching and learning; 8 of the 11 reported student achievement data, 5 of the 8 were case studies, and 3 of the 8 used self-report surveys to assess PLC practices (Saunders et al., 2009). This study will therefore expand the research on these important areas. Although it may not be generalizable, it should provide helpful insights to other schools implementing similar programs. It should also

help stimulate further research on this important topic by providing potential avenues for further study.

Delimitations

Delimitations narrow the scope of the study. The following were delimitations of this study:

1. The study only investigated PLCs in one Pre-K through First Grade primary school.
2. Subjects included only teachers from one primary school who have worked within the PLC process.
3. Teachers participating in this study are required to participate in PLC training and to fully participate in PLC team meetings.
4. Participation in this study is voluntary.

Assumptions

The researcher made the following assumptions regarding this study:

1. Each participant is an active member of an ongoing professional learning community.
2. Participants will answer the survey questions about their PLC perceptions truthfully.
3. Participants are familiar enough with the PLC process to answer the survey questions.

Definitions of Terms

Collaboration: Collaboration is a process when members of a team "work interdependently to achieve common goals" (Eaker, DuFour, & DuFour, 2002, p. 11).

Common Formative Assessment: Common formative assessments are formative assessments that are collaboratively determined or developed by a team of teachers that are responsible for teaching the same grade level or course. Teams administer these assessments to all students in the grade or course and use the results for the purpose of checking, analyzing and

responding to student learning of essential pre-determined learning targets. Common formative assessments are used to identify:

- individual students who need more time or support for learning.
- areas in which students are generally having more difficulty achieving the intended objective.

Differentiated Instruction: Differentiated Instruction is a teaching theory based on the premise that instructional approaches should vary and be adapted in relation to individual and diverse students in classrooms (Tomlinson, 2011).

Formative Assessment or Assessment for Learning: An assessment can be considered formative if its primary purpose in both its design and use is to serve the purpose of promoting students' learning (Stiggins, Arter, Chappuis, & Chappuis, 2004). Formative assessment practices provide feedback to the teacher and the student regarding performance and learning. Observations of students, classroom discussions, student questioning, examination of student work, use of exit slips, quizzes and other tests are examples of potential formative assessment practices. Such assessment practices become formative when the evidence gained is actually used to adapt instruction in order to better meet student needs. Formative assessments occur while the learning of a particular learning goal or target is occurring.

Professional Learning Community: PLCs are a model for staff development/ professional improvement in which the teachers in a school and its administrators come together on an ongoing basis to collaboratively seek and share learning and then act on what they learn. The goal of their actions is to enhance their effectiveness as professionals so that students benefit. Key features of a professional learning community include a collaborative culture, a

focus on learning rather than teaching, a focus on results, and a mindset of continuous improvement (Brookhart, 2009).

Summative Assessment or Assessment of Learning: Summative assessments typically occur after a learning cycle of a particular learning unit or goal has occurred. The evidence gathered from the assessment is used to judge a student's learning against set standards of performance and competence or against the performance of other students. Summative assessments are typically used to assign grades, rank students or certify competence. End of unit tests, standardized tests, criterion-referenced tests and even homework or student learning projects that are used to determine final grades are examples of summative assessments. Opportunities for teachers to use the evidence to adapt current instruction or for students to receive feedback that they can use as their learning is occurring are absent in summative assessments (Ainsworth & Viegut, 2006).

Summary

The researcher understands that this study is small and focused on only one school within one district and education organization serving children of active duty military members. However, this study could have implications for other schools within this particular district as well as other districts comprised of schools located on military instillations.

Chapter I introduced the framework that guided the study, the background of the study, the purpose of the study, and the study significance. Chapter II contains literature and research pertaining to the three PLC practices that were piloted at Angel Primary School during the 2012–2013 school year and are being implemented school-wide during the 2013–2014 school year. The three PLC practices are Common Formative Assessment, the Collaboration Plan, and Differentiated Instruction. The literature review is divided into four major sections and presents

research that has already been conducted pertaining to PLCs in general as well as to each of the three PLC practices implemented at Angel Primary School. Each of the four sections is divided into three subsections. The first subsection provides an overview of the section topic, the second subsection presents research related to relationships between the topic of focus and instructional practice, and the third subsection presents research related to relationships between the topic and student learning outcomes.

Chapter III presents the Methodology used for this study, including the research design, selection of the sample, data collection procedures, and the data analysis process. Chapter IV contains research results and findings, and Chapter V provides a discussion of the results as well as implications and recommendations for further research studies which prove beneficial to this topic.

CHAPTER II: REVIEW OF THE LITERATURE

Introduction

The purpose of the study is to use a model school as a case in an investigation of a common formative assessment tool, differentiated instruction plan, and collaboration plan which were the focus of a year-long pilot conducted by the school Professional Learning Community (PLC) and are currently the innovations of a school-wide change initiative. The researcher seeks to determine which elements utilized by the PLC during the pilot were related to improved teaching and learning, how the PLC elements were implemented school-wide, and teacher and administrator perception of the practices during the first year of school-wide implementation.

This chapter is designed to present a review of the literature related to PLCs as a vehicle for change in teaching practices and the relationship between those practices and student learning outcomes. PLCs in schools place emphasis on three overarching components: collaborative work that allows professionals to participate in purposeful discussions, a robust focus on teaching and learning, and the collection and use of data to inform instructional practices and monitor progress over time (Giles & Hargreaves, 2006; Newmann et al., 2000).

This chapter is divided into four sections. The first section provides a history and definition of PLCs, the relationship between PLC practices and instructional practices, and the relationship between PLC practices and student achievement. Each subsequent section is representative of one component that emerged through the review of the literature. These sections are Collaboration, Common Formative Assessment, and Differentiated Instruction.

Principles of Professional Learning Communities (PLCs)

The framework of the study is based on the five principles of PLCs identified through the work of Shirley M. Hord's (1997, 2004) five attributes of PLCs. Hord (1997) discussed the term 'Professional Learning Community' as being used to describe a variety of different practices from extending classroom instruction to the community surrounding the school to the communication that takes place between students and teachers. She explained that the concept of professional learning originated in organizations outside the education profession and was introduced by organizational theorists such as Peter Senge (1990).

Hord (1997) presented PLCs as both a powerful approach to staff development and a compelling strategy for continuous school improvement and positive change. Through her research, Hord (1997, 2004) identified five attributes or dimensions that define PLCs in the educational setting: 1) Shared and Supportive Leadership, 2) Shared Vision and Values, 3) Collective Learning and the Application of that Learning, 4) Shared Practice, and 5) Supportive Conditions for the Maintenance of the Learning Community.

Shared and Supportive Leadership

The first of the five attributes identified by Hord (1997, 2004) is Shared and Supportive Leadership in which leaders plant the seeds of community and collaboration then nurture and protect the learning community as it grows. When leaders are serious about sharing leadership and supporting other developing leaders, they lead by following and serving and encourage others to share the responsibilities of leadership (Sigurðardóttir, 2010). Leithwood, Leonard, and Sharratt (1998) emphasized the importance of a campus administrator who can let go of power and share the leadership of a school if the goal is to have a staff that is learning together and participating in decisions about school operations. When school leaders share leadership they

not only provide necessary support for collaboration, they also work alongside teachers in the collaboration process asking questions, investigating, inquiring, and seeking school improvement solutions.

Shared Values and Vision

A second primary attribute defining PLCs identified by Hord (1997) is Shared Values and Vision. Hord explained that when values and vision are developed and shared by all stakeholders, high expectations for staff work, professional development, and student learning are evident throughout the school culture. A shared vision is more than a group of individuals in agreement with a particular idea or having similar goals; it is a clear, mutual understanding of where the members of an organization desire the organization to ultimately be in the future and having knowledge of what it will take to get there. In schools where a shared vision is firmly in place the faculty and staff view students as capable learners and work to create a culture and environment that ensures students reach their full potential (Hord, 1997). Martel (1993) maintained that schools working as PLCs with a shared vision are focused on total quality in life, work, and learning.

Collective Learning and Application of Learning

Collective Learning and Application of Learning, the third attribute defining PLCs identified by Hord, is evident in schools when educators from all levels, subject areas, and departments work together to gain new knowledge that will promote student learning and highest student achievement. Louis and Kruse (1995) stated that this type of collective creativity evolves through reflective dialogue and formal and informal conversations about teaching practices and student learning. The success and sustainability of a PLC that learns collectively is influenced by the degree of school staff commitment to utilizing the talents and strengths of all

members to push for a high quality of intellectual learning for both themselves and the students they teach (Newman & Wehlage, 1995). These schools move from placing emphasis on operational issues such as schedules and policy issues to focusing on areas that support school improvement. Inquiry also emerges as PLC participants learn collectively. This inquiry fosters the creation of ties that bind school teachers and leaders together as a community of learners with a set of shared ideas (Sergiovanni, 1994).

Shared Personal Practice

The strategy of teachers openly sharing personal instructional practice was also identified as a defining attribute of PLCs. Louis and Kruse (1995) discussed the fact that a teacher reviewing the practices of their peers is common in PLCs. The researchers explained that shared personal practice is non-evaluative in nature, is based on a shared pursuit of individual and school improvement, and is only successful in a culture of trust and mutual respect (Kruse et al., 1994). The issue of teaching in isolation must be directly confronted through a formalized structure for teacher interaction in order for schools to improve teaching and learning. When given opportunities to interact, teachers build mutual respect and trust and become increasingly committed to their work (Elmore, 2000). According to Hord (1997), shared personal practice is often the last of the attributes to develop and requires a paradigm shift from the traditional practice of teaching in isolation.

Supportive Conditions

Supportive conditions, a final attribute of PLCs identified by Hord (1997), determines when, where, and how school staffs collaborate for the purpose of making decisions, solving problems, and working creatively. This attribute has been defined as the most critical factor for school improvement because it provides the structures that sustains and supports the school

vision and the functions of the learning community. Hord addressed two categories of supportive conditions; physical and structural conditions and people capacities. Among the physical and structural conditions that support PLCs are time to collaborate, structures that reduce teacher isolation, available materials and resources, school autonomy, quality staff development, and teacher empowerment (Boyd & Hord, 1994; Kruse et al., 1994). People capacities that support PLCs include highly qualified teachers, positive teacher attitudes, respect and trust among school and district level educators, supportive leadership, positive relationships among all stakeholders, and a sense of community in schools (Kruse et al., 1994).

A second framework which shared many commonalities with the principles identified by Hord (1997, 2004) was of interest to the researcher. This framework was composed of the Six Key Principles of PLCs identified by the National Commission on Teaching and America's Future (NCTAF) and presented in a document titled *Team Up for 21st Century Teaching and Learning: What Research and Practice Reveal about Professional Learning* (2010). This framework was not necessarily used to guide the study and was not part of data collection and analysis; however, because of the relationships that exist between this NCTAF (2010) framework and the work of Hord (1997, 2004), this framework was informally considered throughout the study and was described in this review of literature. NCTAF was founded in 1994 and works alongside national, state, and local education agencies to develop research-based programs and practices that support collaborative cultures and continuous professional development in schools. In 2010, under the leadership of NCTAF president Dr. Thomas G. Carroll, and in response to the implementation of the national 2020 initiative, the organization conducted research that included a review of research and case studies pertaining to collaborative professional learning. The researchers stated that the practice of teachers working in isolation

and attempting to meet the diverse needs of all students alone is not only ineffective but unsound economically in the 21st century (Carroll et al., 2010). "Just giving today's students a better factory-era school, with teachers delivering text-based instruction in stand-alone classrooms won't prepare them for the 21st Century" (Carroll et al., 2010).

Six principles of successful PLCs emerged. The six essential elements of PLCs identified by NCTAF are: 1) Shared Values and Goals, 2) Collective Responsibility, 3) Authentic Assessment, 4) Self-Directed Reflection, 5) Stable Settings, and 6) Strong Leadership Support. These are aligned with Hord's five characteristics that define PLCs. The two frameworks, Hord (Hord, 1997) and NCTAF(Carroll et al., 2010), encapsulate current research and practice of PLCs.

Shared Values and Goals

In support of the first principle, Shared Values and Goals, NCTAF (2010) stated that the PLC must share in their beliefs about what the students and teachers are capable of achieving and must have the common goal of improving student learning. This element aligned with Hord's PLC principle, Shared Values and Vision.

Collective Responsibility

Collective Responsibility, the second element of PLCs identified by NCTAF is strongly associated with Hord's Collective Learning and Application of Learning principle but also includes the idea that all PLC participants should be mutually held accountable for student learning and should have differentiated responsibilities in educating students based on their experience and areas of strength (Carroll et al., 2010).

Authentic Assessment

The third NCATF element, Authentic Assessment, is the only element that was not directly linked to Hord's five principles defining PLCs. NCATF stated that authentic assessments that provide frequent and formative feedback related to both teaching and student learning should be used by all teachers involved in PLCs. Authentic assessments are essential tools to develop instructional practices and improve learning (Carroll et al., 2010)

Self-Directed Reflection

Self-Directed Reflection aligned with Hord's Shared Practice. This element supports collaborative opportunities for school leaders and teachers for the purpose of identifying student and teacher needs and establishing shared practices pertaining to goal-setting, planning, and evaluation.

Stable Settings

The fifth element identified by NCATF, Stable Settings is intertwined with Hord's Supportive Conditions. Both state that dedicated and formally established time and space for collaboration are necessary for successful and sustainable PLCs.

Strong Leadership Support

The final element, Strong Leadership Support, was found to be closely aligned with the defining principle Supportive and Shared Leadership. This sixth NCATF element discussed that school leaders where PLCs are firmly in place build climates of trust, respect, and openness in the school, encourage and support team decisions related to student needs, and apply appropriate position power when necessary (Carroll et al., 2010).

Figure 1 depicts the relationships between the Five Principles of PLCs in Hord's (1997, 2004) framework and the Essential Elements of PLCs in the NCTAF (2010) framework.

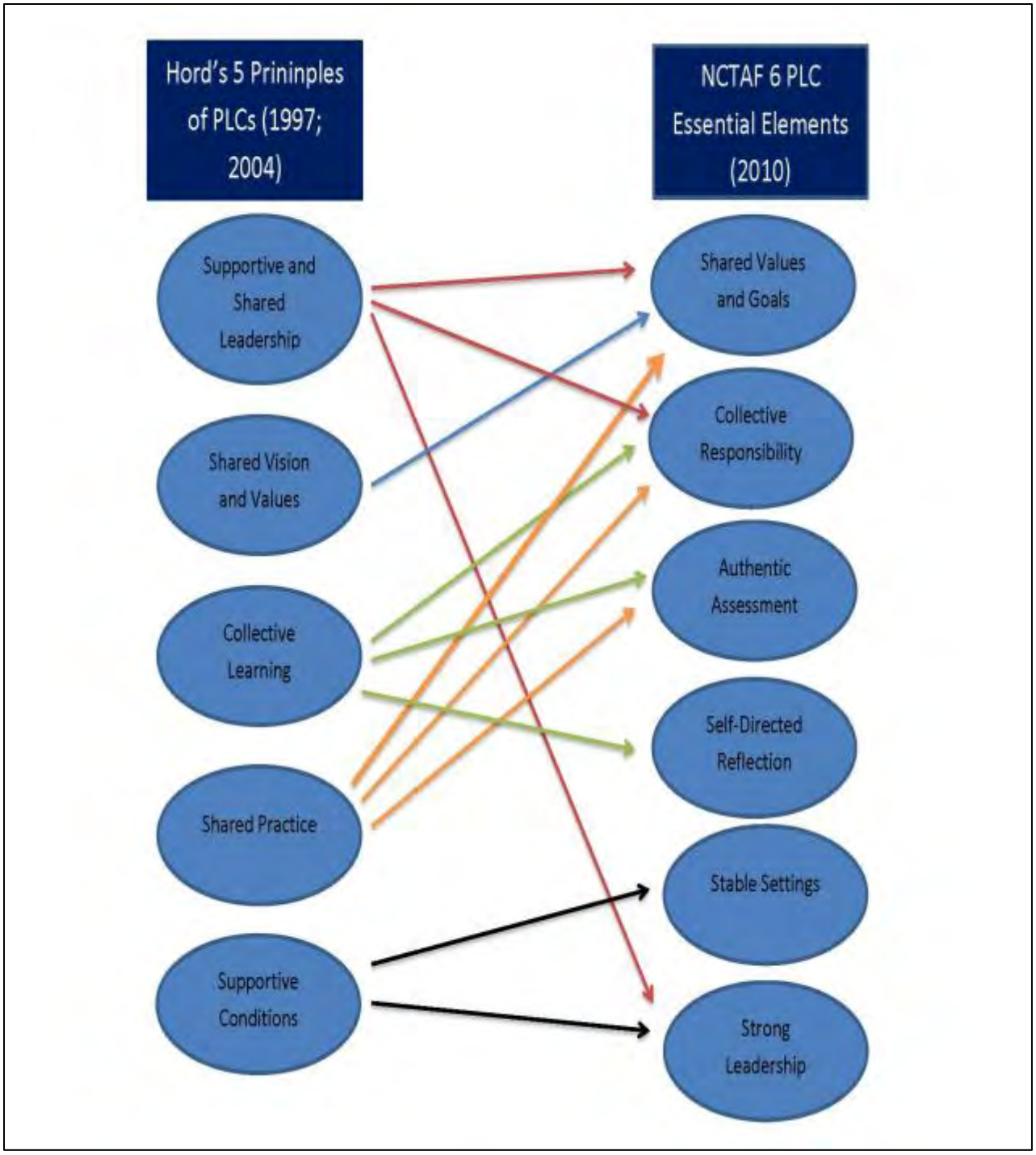


Figure 1. Connections between Hord's Five Principles of Professional Learning Communities and the National Commission on Teaching and America's Future Six Essential Elements of Professional Learning Communities

Professional Learning Communities

Professional Learning Communities (PLCs), Professional Learning Teams, Learning Organizations, and Collaborative Professional Organizations are just a few of the terms commonly used among education organizations to describe a wide variety of educational groupings working in a wide variety of capacities. Ambiguity of the term can result in confusion in the PLC implementation process. The concept of groups of professionals working together in a collaborative environment originated in the business sector. Many esteemed organizational experts endorsed and have been advocates of PLC development. "Preferred organizations will be learning organizations.… It has been said that people who stop learning stop living. This is also true of organizations" (Handy, 1995).

> The new problem of change … is what would it take to make the educational system a learning organization, expert at dealing with change as a normal part of its work, not just in relation to the latest policy, but as a way of life. (Fullan, 1993, p. 4)

A great deal of curiosity and interest in PLCs was sparked by Senge's reintroduction of "learning organizations" in his seminal book *The Fifth Discipline* in 1990. In his text Senge (1990) stated, "The most successful corporation of the future will be a learning organization" (p. 4). In response to overwhelming interest of educators in "learning organizations" presented in *The Fifth Discipline*, Senge followed with the publication of *Schools that Learn* in 2000.

There are varied definitions for PLCs that increased understanding of the intended purpose of this model. Huffman and Jacobson (2003) define PLCs as:

> A term used to refer to a school organization in which all stakeholders are involved in joint planning, action, and assessment for student growth and school improvement ...

> where difficult things can be talked about, where hard questions about teaching and learning get asked, and where adults can learn from each other. (p. 240)

Another definition of PLCs providing a more detailed description comes from Bolster and Henley (2005):

> PLCs are small groups of teachers (3–5) working together on a regular basis for learning, joint planning, and problem solving. PLCs can be organized by grade levels, multiple grade levels, departments, or interdisciplinary groups. The members of each group interact with each other and depend upon each other for the accomplishment of specific goals. The group stays together long enough to form habits and conventions. An effective learning community cultivates an attitude of inquiry and focuses attention on student thinking and understanding. In a dynamic learning community, everyone learns. (p. 1)

A third and more systematic definition of PLCs comes from Brookhart (2009):

> A professional learning community is defined as a group of 4–6 teachers or administrators who do the following:
>
> 1. meet regularly,
> 2. work on shared goals and related tasks between meetings, and
> 3. accomplish shared goals. (p. 1)

Although the definitions listed above differ in some ways, all have the same core purpose: allowing educators the opportunity for a more collaborative culture where more time is given for teachers to talk about teaching and collectively work toward improving student learning.

In schools, the learning community is demonstrated by people from multiple constituencies, at all levels working together in a culture of collaboration (Kruse et al., 1994).

Such collaborative work is grounded in what Kruse, Louis and Bryk (1995) labeled "reflective dialogue", in which an educational staff conducts conversations about students and teaching and learning, identifying related issues and problems (Kruse et al., 1994).

PLCs have earned large amounts of attention from researchers over the past twenty-five years (Feger & Arruda, 2008). School districts across the country have begun the implementation of PLCs in schools as a vehicle for positive change and a strategy for improved professional development. The argument was made that teachers left to work in isolation with little to no opportunity to collaborate with other professionals are highly unlikely to work to improve their own instruction (Elmore, 2000; Goldenberg, 2004). The long-term trend of researching PLCs and teacher collaboration was evident in the National Staff Development Council's (2001) standards for professional development. The standards included educators being organized into learning communities that meet regularly to learn collaboratively, plan lessons together, and solve problems (Darling-Hammond, 2008; Saunders et al., 2009). Although a great deal of research has been conducted related to PLCs in education since Senge (2000) with topics ranging from the characteristics of PLCs to successful implementation; rigorous research and evaluation studies of relationships between PLCs and instructional practices and student achievement are limited in number. In a quasi-experimental study conducted by Saunders, Goldenberg, and Gallimore (2009) the authors reported that there were very few studies that measured the impact of PLCs on student learning: 55 books, papers, and articles in U.S. Literature from 1990–2005 using learning team related search terms, 11 were empirical studies considering the impact of PLCs on teaching and learning, 8 of the 11 reported student achievement data, 5 of the 8 were case studies, and 3 of the 8 used self-report surveys to assess PLC practices (Saunders et al., 2009).

PLCs are grounded in two assumptions. The first assumption is that knowledge is situated in the day-to-day lived experiences of the teacher and best understood through critical reflection with others who share the same experience. The second assumption is that actively engaging teachers in PLCs will increase their professional knowledge and enhance student learning (Buysse, Sparkman, & Wesley, 2003). With this in mind, the purpose of this section of the literature review is to provide a review of research available that examines the role of PLCs in positive change related to teaching and learning. In order to provide a comprehensive understanding this section of the review will begin with an overview of the characteristics of PLCs that have emerged through research and will then address the relationship between fully implemented PLCs and teaching practices and student learning.

Characteristics of Professional Learning Communities

Innovative schools have historically practiced some of the properties of PLCs; however, few have successfully sustained the positive affects the properties have had on teaching and learning over time (Giles & Hargreaves, 2006). "Effective professional learning communities promote and sustain the learning of all professionals in the school community with the shared goal of enhancing pupil learning" (Stoll et al., 2006, p. 3). The elements of PLCs vary from researcher to researcher and study to study. Jakyl (2011) discussed that PLCs have historically been implemented in a variety of formats from small collaborative groups to a collection of small groups at a school, region, or district level. A study conducted in three schools in Iceland by Anna Kristin Sigurðardóttir (2010) was based on two areas of educational research: studies on school effectiveness and development and studies on schools as PLCs, and examined the characteristics of successful PLCs. The author discussed the characteristics of (PLC's) and how they can be related to positive change in teaching and learning. The author cited Hord (1997,

2004) in the five attributes or dimensions of PLCs which stated that PLCs are supportive and share leadership, have shared values and vision focusing on pupil learning, learn collectively, have supportive conditions, and share personal practice (Sigurðardóttir, 2010). PLCs were defined as "a group of professionals sharing common goals and purposes, constantly gaining new knowledge through interaction with one another and aiming to improve practices" (Sigurðardóttir, 2010).

The National Commission on Teaching and America's Future (NCTAF) presented a document titled *Team Up for 21st Century Teaching and Learning: What Research and Practice Reveal about Professional Learning* (2010). The document included a synthesis of research findings, five chapters related to PLCs, teacher collaboration and inquiry and practice, and concluded with four different case studies reflective of schools as PLCs.

The NCTAF (2010) research verified that in order to accomplish the two goals set out by Plan 2020 major changes in education will have to take place. The two goals were: 1) assuring that every student is college and career ready, and 2) closing achievement gaps for low-income students and children of color. The researchers stated that curriculum, instruction, and assessment designed for the past will not be adequate to meet these goals and that the most critical area in need of change is the actual teaching profession itself (Carroll et al., 2010). "The era of isolated teachers, working alone to meet the myriad of needs of all their students, is neither educationally effective nor economically viable in the 21st Century" (Carroll et al., 2010, p. 7). The synthesis of research conducted by NCTAF (2010) included findings that provided an evidence-based argument for the positive influences collaborative communities have on teaching and learning and focused on the transformation of pure theory into deep practice in schools.

Each of the studies examined in the *Team Up for 21st Century Teaching and Learning* (2010) document produced its own set of Essential Elements found in place in functioning PLCs.

The study conducted by Talbert and McLaughlin (2002) presented an argument that great teaching is not solely about strong individual teachers but more about strong teachers in collaborative communities that support their ongoing growth and improvement. The authors used the following dimensions of teaching as a framework for a strong collaborative community:

- Colleague Relations
- Basis for Course Assignment
- Instructional Practice
- Professional Rewards
- Professional Identity and Commitment

NCTAF presented findings from a study conducted by Stoll, Bolam, McMahon, Wallace, and Thomas (2006) that sought to answer five questions:

1) What are professional learning communities?
2) What makes professional learning communities effective?
3) What processes are used to create and develop an effective professional learning community?
4) What other factors help or hinder the creation and development of effective professional learning communities?
5) Are effective professional learning communities sustainable? (Stoll et al., 2006)

The authors used a wide variety of surveys to collect data in order to answer the five questions. Through the data five shared characteristics of PLCs emerged:

- Shared Values and Vision
- Collective Responsibility
- Reflective Professional Inquiry
- Collaboration
- Group, as well as individual, learning is promoted

The third study presented in the NCTAF document was completed by Goddard, Goddard, and Tschannen-Moran (2007) and examined teacher collaboration for school improvement and student achievement through a theoretical and empirical investigation. The findings of the study weren't related to one specific model or framework but reflected that teacher collaboration did have a statistically significant effect on student achievement in the areas of math and science even when student characteristics and school contexts were considered.

NCTAF provided findings from a research study conducted by Gallimore, Ermeling, Saunders, and Goldenberg (2009) that studied the effects the implementation of an inquiry-based protocol had on teacher perceptions, instructional practice, and student achievement. The study verified that participation in PLCs had a positive influence on teacher attitudes and student achievement (Gallimore, Ermeling, Saunders, & Goldenberg, 2009). A five-component framework was developed for the learning teams studied:

- Set Shared Goals
- Use Meaningful Indicators to Measure Progress
- Capitalize on Assistance of Others
- Use Distributed Leadership to Support Goal Attainment
- Provide a Stable Setting in Which to Meet

A study of science teachers working in a private high school was conducted by Ermeling (2009) and was included in the NCTAF document for the purpose of providing a deeper understanding the effects collaborative inquiry on both teacher and student learning. The author developed a four element framework for the learning teams that were studied:

- Identifying Important Instructional problems
- Connecting Theory to Action
- Utilizing Evidence to Drive Reflection
- Persistently Working Towards Detectable Improvements

Findings and results from all studies synthesized and discussed in the NCTAF document *Team Up for 21st Century Teaching and Learning: What Research and Practice Reveal about Professional Learning* (2010) provided the evidence base for the six principles that NCTAF found present in successful PLCs that lasted over time; 1) Shared Values and Goals, 2) Collective Responsibility, 3) Authentic Assessment, 4) Self-directed Reflection, 5) Stable Settings, and 6) Strong Leadership Support.

Researchers, through their own studies, investigations, and examinations, have arrived at varied models and frameworks for PLCs; however, all factors or characteristics are embedded in each other and are interdependent (Sigurðardóttir, 2010) . The following definition of a PLC was developed by Sigurdardottir (2010) from her study of the work of Hord (1997), McLaughlin and Talbert (2001), Louis et al. (1996), and Leithwood and Louis (1998):

> A professional learning community consists of a group of professionals sharing common goals and purposes, constantly gaining new knowledge through interaction with one another, and aiming to improve practices. It is a cycle where learning is normally embedded into the daily work; teachers gain new knowledge, try it out in practice, and

> from the experience, gain yet more knowledge. They do this in interaction with each other by working collaboratively. This cycle is strongly influenced by structural factors, which can foster collaboration or hinder it; cultural factors, which are people's beliefs and values; a leadership style, which greatly affects both the culture within the school and the structure. (Sigurðardóttir, 2010, p. 397)

The components and dynamics of PLCs are complex. It is impossible to identify one factor as the sole catalyst responsible for positive change in schools. It is critical to be astutely aware of how all factors act on one another and to keep in mind the coherence of factors and their effects on individuals who are part of the PLC. Huffman and Hip (2003) argued that implementation of PLCs is a process not a means to an end. When a school begins the PLC implementation journey it is not possible to predict when, if ever, the school will start seeing positive changes in teaching and learning (Huffman & Jacobson, 2003).

Professional Learning Communities and Teacher Practice

The term PLC is grounded in the notion that the best way to improve student learning is to improve teaching practices (Vescio et al., 2008b). A common assumption across literature pertaining to PLCs was that teaching is still a profession in which practices are conducted in isolation with limited opportunities available for teachers to collaborate and learn together in the context of their work (Giles & Hargreaves, 2006; Lieberman, 2000; Newmann et al., 2000). Research, although not in great magnitude, does exist supporting the idea that teacher participation in PLCs does lead to changes in teaching practice. Louis and Marks found that when a school is organized into a professional community, the following occurs (Louis, 1998):

1) Teachers set higher expectations for student achievement.
2) Students can count on the help of their teachers and peers in achieving ambitious learning goals.
3) The quality of classroom instruction is considerably higher.
4) Achievement levels are significantly higher.

One study conducted by Dunne, Nave, and Lewis (2000) examined a group of teachers over the course of two years for the purpose of comparing instructional practices of teachers who participated in learning communities to the practices of non-participants. The authors stated that participating teachers made changes to their instruction in terms of flexibility and pacing to meet the diverse needs of all their students (Dunne, Nave, & Lewis, 2000). In a study conducted by Hollins, McIntyre, DeBose, Hollins, and Towner (2004) twelve teachers participated in collaboration meetings for the purpose of addressing the challenges of teaching struggling African American students. The teachers reported that by the tenth collaboration session their focus had shifted from discussions about their own challenges to the development of strategies to be implemented to positively affect student learning. Observation and interview data collected in a study by Louis and Marks (1998) indicated that teachers participating in PLCs experienced high levels of social support for the implementation of instruction that emphasized higher order thinking skills, conversations for the purpose of constructing meaning, and increased depth of knowledge. Teachers participating in a PLC developed a shared mission based on integrity, respect, discipline, and excellence which led to stronger instructional practices in reading, writing, and self-selected reading (Strahan, 2003). The positive effects of PLC participation on teaching practices have also been described by Sparks (2005) who wrote, "Well-implemented PLCs are a powerful means of seamlessly blending teaching and professional learning in ways

that produce complex, intelligent behavior in all teachers" (Sparks, 2005). Vescio, Ross, and Adams (2008) recognized a paradigm shift in the type of professional development that can have direct and positive impacts on teaching and learning and as a result presented a review of literature pertaining to one model that supports this change: PLCs. The findings that emerged from the reviewed literature provided the following information:

1) Participation in learning communities influences teaching practices as teachers become more student centered, and teaching culture improves due to increased collaboration with a focus on student learning.
2) Students also benefit from teacher participation as indicated by improved achievement scores.

In spite of the fact that there is limited empirical research out there to verify the extent to which PLCs consistently affect instructional practices, there is research supporting that effectively implemented PLCs does offer educators frequent opportunities to collaborate with common goals in mind. PLCs in schools can serve as a source of support and motivation to teachers working to positively affect change in spite of obstacles such as limited resources, isolation, and time constraints. Teachers who are participants in strong PLCs collaborate more effectively to create and sustain opportunities for student learning (Kruse, Seashore Louis, & Bryk, 1994).

Professional Learning Communities and Student Learning Outcomes

In a time when accountability in education is at an all-time high decisions pertaining to the success or effectiveness of PLCs will be determined based on evidence that practices increase student achievement (Vescio et al., 2008b). Berry, Johnson, and Montgomery (2005) conducted a study in which the progress of a rural elementary school was monitored over a four-year

period. Student learning data from classes taught by teachers who participated in PLCs was compared to student learning data from class taught by teachers who had not participated in PLCs. Through the course of the study grade level assessment results indicated a 30% increase in students performing at or above grade level when PLCs were implemented in the school (Berry, Johnson, & Montgomery, 2005). Phillips (2003) conducted a case study for the purpose of examining and documenting the work of middle school teachers who were utilizing PLC practices to target and provide intervention to a group low, at risk students. State-wide standardized test scores in reading, writing, math, science, and social studies went from a 50% pass rate in 1999–2000 to a 90% pass rate in 2001–2002 after PLCs were implemented in the middle school (Phillips, 2003; Vescio et al., 2008b) . In a study that examined student proficiency of three struggling elementary schools, on the state achievement tests increases from 50% to 75% over a three year period of time in settings where PLCs were implemented occurred (Strahan, 2003; Vescio et al., 2008b). A study conducted by Hollins, McIntyre, DeBose, Hollins, and Tower (2004) examined student achievement among African American second and third grade students in schools where teachers were collaborating with a focus on student learning. Study findings verified that students in both grade levels outperformed their district counterparts in schools where teachers were not offered collaboration opportunities.

Research does appear to validate that the stronger and more structured the PLC in particular schools, the greater the increases in student achievement. Evidence did suggest that communities which were engaged in structured instructional discussions that investigated the relationships between instructional practices and student work produce significant increases in student achievement (Supovitz, 2002; Supovitz & Christman, 2003; Vescio et al., 2008b).

The sections that follow are arranged in the order that each PLC practice occurred in the PLC cycle utilized at Angel Primary School. The first practice in the cycle is the administration of the common formative retell assessment at all grade levels. Once student learning data was generated by the formative assessment collaboration was conducted for the purpose of analyzing the data, planning differentiated instruction, and planning interventions. Based on discussion and decisions that emerged through the collaboration stage of the cycle, differentiated instruction was implemented. Although there were times that the PLC practices occurred out of sequence due to special issues, Angle Primary School PLC was true to the order of the cycle. The conceptual model that follows provides a visual of the cycle (see Figure 2).

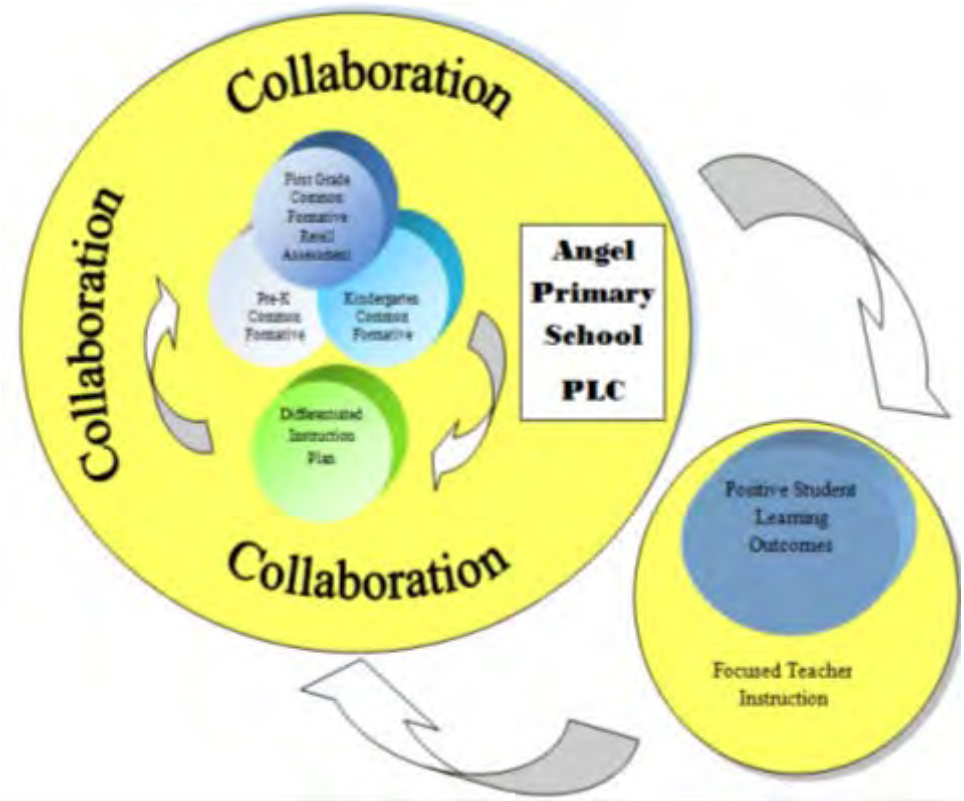


Figure 2. Conceptual Framework for the Implementation of the Three Professional Learning Community Practices at Angel Primary School

Common Formative Assessment

Common Formative Assessment was the practice that began the PLC implementation cycle at Angel Primary School; therefore, it is the first section addressed in this review of literature. Teachers' survey and interview responses indicated that a need exists from more time should be set aside for formal collaboration and that the time requirement for the administration of the Common Formative Assessment may outweigh the value of the student learning data generated by the assessment.

While all components are essential for a team of teachers to function as a professional learning community, it is the focus on actual results of student learning that distinguishes (PLC's) from other collegial and collaborative groups of teachers that come together to discuss curriculum and instruction (DuFour et al., 2006). Assessment serves many purposes in schools and classrooms. Assessment results are used in planning instruction, guiding the differentiated instruction process, monitoring student achievement, and determining curriculum effectiveness. Assessment outcomes allow teachers to gauge student knowledge and skill acquisition and to determine other factors that may affect student learning such as social factors, student participation and interaction, and student attendance (Young & Kim, 2010).

Standardized tests, both norm and criterion-referenced, have been a major determining factor in the growing emphasis on school and district accountability since the 1980s (Stiggins, 2005). The passage of the No Child Left Behind (NCLB) legislation in 2001 resulted in the implementation of negative consequences for schools failing to meet accountability expectations on state tests. The added dimension of consequences was intended to serve as a stimulus for educational improvement through its increased reliance on assessment results for public accountability purposes (Stiggins, 2005). While the frequency of administration of standardized

tests and the value of assessment results in relation to accountability have grown substantially in the past 25 years, data generated from using assessments in this way does not indicate an improvement in student learning.

Volante and Beckett (2011) discussed a paradigm shift in research on assessment. The authors credit this shift to earlier research conducted by researchers like Black and Wiliam (2009) and Earl and Katz (2006) who identified assessment practices that most likely lead to higher student achievement. These authors defined summative assessment as "assessment of learning" typically conducted at the end of a unit or term and formative assessment as "assessment for learning" typically conducted throughout the unit or term. Both forms of assessment serve specific and separate functions, summative and formative assessments are not mutually exclusive in practice. That is, it is the purpose of the assessment, rather than the task, that delineates the form of the assessment (Earl & Katz, 2006; Volante & Beckett, 2011). Volante and Becket (2011) presented research indicating that teachers have struggled in the implementation of varied types of assessment in purposeful ways that can result in improved student achievement.

Formative assessment has been recognized as an urgent priority by educational researcher, assessment specialists, and practitioners around the world (Brown, 2004; Dekker & Feijs, 2005; Stiggins et al., 2004). Experts in the field formative assessment is one of the most powerful instructional tools available to a teacher or school for advancing achievement levels (Guskey, 2007; Stiggins, 2005; Stiggins & DuFour, 2009). However, within increased accountability and high-stakes, large-scale testing programs have led teachers to feel pressured to dedicate much of their instructional time preparing students to perform well on these summative assessment measures. Internationally there is debate about the need for accountability while

formative assessment is seen as more valuable to teaching and learning; however, refocusing assessment strategies on more formative approaches requires a change in the "learning culture" (Shepard, 2000, p. 23). When formative and summative functions of assessment are aligned so that the signals about what counts as achievement are consistent to educators, students, parents, and the public, assessment is expected to improve student learning (Wilson & Bertenthal, 2005).

Black, Harrison, Lee, Marshal, and Wiliam (2002) provided the following definition of formative assessment in a short publication for educational practitioners:

> Assessment for learning is any common formative assessment for which the first priority in its design and practice is to serve the purpose of promoting pupils' learning. It thus differs from assessment designed primarily to serve the purposes of accountability, or of ranking or of certifying competence. An assessment activity can help learning if it provides information to be used as feedback, by teachers, and by their pupils in assessing themselves and each other, to modify the teaching and learning activities in which they are engaged. Such assessment becomes 'formative assessment' when the evidence is actually used to adapt the teaching work to meet learning needs. (p. 64)

It is necessary that the definition of formative assessment be detailed and precise due to the frequency with which the term is misinterpreted. Educators have applied the term to a variety of assessment activities from administering a test with great frequency then holding conferences with students to discuss their work to ongoing assessments that are designed to prepare students for externally imposed tests (Black & William, 2009). Black and Wiliam (2009) explained that if the assessment results do not influence future instruction the assessment is not formative but rather summative assessment administered frequently. Any assessment given at the end of a unit of learning is too late for formative purposes because it doesn't provide any opportunity for the

teacher to use the results to provide constructive feedback early enough to improve individual student performance (Black & Wiliam, 2009).

Dufour, Dufour, and Eaker (2004) describe common formative assessment as being created collaboratively by a team of teachers and used frequently throughout the year to identify 1) students needing additional time and support for learning, 2) teaching strategies that foster student acquisition of intended knowledge and skills, 3) areas of difficulty for students, and 4) future goals for individual teachers and the team.

The philosophy, focus, structure and collaborative nature of PLCs are closely aligned the goal of increased use of common formative assessments as a means for improving student learning. Many experts believe that the deliberate use of PLCs in schools can result in the effective development and use of common formative assessments, therefore redefining the role of assessment in school improvement (Ainsworth & Viegut, 2006; DuFour et al., 2006; Stiggins & DuFour, 2009).

Formative Assessment and Teacher Practices

A study conducted by David Carless (2007) introduced dimensions of formative assessment that were not articulated in previous literature. Carless discussed pre-emptive formative assessment as assessment that is designed to identify student understandings before gaps in learning can negatively impact outcomes. The author explained that the intent of the study was not to provide detailed definitions of formative assessment but rather to foster deeper understandings of teacher actions to facilitate formative assessment. "The teacher is a key mediator in enhancing student learning; improvements in the implementation of formative assessment depend largely on teachers' understandings of principle and practice in formative assessment" (Carless, 2007, p. 172).

The analysis of research conducted by Carless (2007) presented possibilities for formative assessment use by teachers in classrooms. The research described the need to make formative assessment more attractive and manageable for teachers and discussed the value of establishing common formative assessments that generate data teachers can regularly use to inform instruction and monitor student progress.

Carless (2007) also explained that planned formative assessment is more formal and provides information about next steps the teacher should take in instruction while interactive takes place during student/teacher interactions. In interactive formative assessment, information obtained is not usually documented, and the way the assessment is conducted may look different from student to student. Each of the assessment approaches can lend themselves to both individual and whole-group applications. "The idea that formative assessment can be conducted in multiple formats opens up new possibilities for implementation by teachers" (Carless, 2007, p. 175).

Hattie and Timperley (2007) identified the value and merits of pre-emptive formative assessment explaining that pre-emptive formative assessment is assessment that is conducted early enough in the learning process to allow the student become aware of problems in their learning and to address them before they lead to negative outcomes. It is a strategy which has its basis in the centrality of feedback in the learning process and attempts to tackle the problem that much feedback comes too late to be of maximum benefit (Hattie & Timperley, 2007). Carless (2007) maintained that pre-emptive formative assessment allows students to actively participate and monitor their own learning.

Torrance and Pryor (2001) examined the outcomes of a research project that investigated the development and use of formative assessments in primary schools. The researchers were

particularly interested the further development of theory related to formative assessment and in understanding ways that professional development that is built on collaborative action research could affect change in classroom assessment and instructional practice. The study also identified two approaches to formative assessment: convergent and divergent assessment.

Formative Assessment and Student Learning Outcomes

In reference to the relationship between PLCs and student learning, experts in the field of assessment and school improvement agree that the creation and use of frequent, common, high-quality formative assessments by teachers who are working collaboratively to help a group of students develop agreed upon knowledge and skills is a powerful strategy for improving student learning (Reeves, 2007; Schmoker, 2002; Stiggins et al., 2004). According to Ainsworth and Viegut (2006), common formative assessments can result in the following positive outcomes:

1) Consistent expectations within a grade level, course, and department regarding standards, instruction, and assessment practices;
2) Regular and timely feedback regarding student attainment of the most critical learning standards;
3) Multiple-measure assessments that allow students to demonstrate their understanding in a variety of formats;
4) Agreed-upon criteria for proficiency to be met within each individual classroom, grade level, and school;
5) Deliberate alignment of classroom, school, district, and state assessments to better prepare students for success on state assessments;
6) Predictive value as to how students are likely to do on each succeeding assessment in time to make instructional modifications; and

7) Ongoing collaboration opportunities for grade-level, course, and department teachers.

DuFour et al. (2006) explained that using common formative assessments can positively affect student learning. The researchers explained that Common Formative Assessments: 1) Are more efficient than assessments created by individual teachers, 2) Are more equitable for students, 3) Can determine whether the guaranteed curriculum is being taught and more importantly learned, 4) Can inform the practice of individual teachers, 5) Can help to build a team's capacity to improve its program, and 6) Can help to facilitate a systematic and collective response for students who are struggling.

A study conducted by Shavelson et al. (2008) took an in-depth look at how the relationship between curriculum developers and assessment developers might ultimately impact student achievement. The "big idea" of the study was that for a very small investment student learning and achievement could be substantially improved if assessment developers could work along-side curriculum developers to embed formative assessments within the curriculum and then teachers used the formative assessment data to guide teaching and learning.

The researchers recognized that summative assessment is the most widely used instrument in determining the success of reform initiatives and also for school accountability; however, they also verified the need for assessments that provide immediate feedback on how to improve student learning, formative assessments. When formative and summative functions of assessment are aligned so that the signals about what counts as achievement are consistent to educators, students, parents, and the public, assessment is expected to improve student learning (Wilson & Bertenthal, 2005). Shavelson (1995) stated, "Assessment development can reshape the curriculum itself, by clarifying goals, by identifying inconsistencies in or between lessons, or by identifying extraneous lessons." The Shavelson et al. (2008) study utilized a collaboration

group composed of curriculum developers from the Curriculum Research & Development Group (CRDG) at the University of Hawaii and assessment developers in the Stanford Education Assessment Laboratory (SEAL) at Stanford University to accomplish two goals: (a) to determine if embedding formative assessments within a curriculum would improve teaching and learning, and (b) to evaluate the assessment development process that emerged through this collaboration process. Study findings suggested that when teachers employ formative assessment embedded curriculums increases may be seen in student learning and achievement. Greater lessons were learned through the collaboration process between the assessment developers and the curriculum developers. Both groups stated that they have in increased awareness of specific actions that contribute to effective collaboration and understand how their lessons learned can inform other such collaborations.

A study completed by Volante and Beckett (2001) utilized individual interviews to collect data from twenty elementary and secondary teachers for the purpose of answering two questions pertaining to how the teachers; used questioning, gave feedback without grades, used self and peer assessment, used formative assessment summatively in their classrooms. Overall findings from the study suggested that although teachers use certain practices associated with formative assessment, there is an imbalance in the use of particular strategies associated with improvements in student learning (Black & Wiliam, 1998; Popham, 2006; Stiggins & DuFour, 2009). The study results indicate that teachers are becoming increasingly interested in the concept of improving student learning rather assessing to generate grades.

Collaboration

The utilization of a collaboration plan was the second stage in the PLC implementation process at Angel Primary School. After data was collected through the administration of the formative assessment at all grade levels, the PLC met weekly for the purpose of analyzing data and planning instruction to address strengths and weaknesses identified through data analysis. Because collaboration occurred just after the collection and analysis of formative assessment data, the collaboration section of this review of literature follows the section pertaining to formative assessment and is the second section after the presentation of research related to PLCs in general.

Collaboration is central to PLC implementation and sustainability. It is the interactive structure that brings teachers out of isolation and facilitates opportunities for discussions and problem solving to occur that lead to continuous school improvement. "The single most important factor for successful school restructuring and the first order of business for those interested in increasing the capacity of their schools is building a collaborative internal environment that fosters cooperative problem-solving and conflict resolution" (Eastwood & Louis, 1992, p. 215). A wide range of research has been done to investigate the relationship between teacher collaboration in schools and instructional practices and ultimately student achievement by researchers around the world. However, there is little empirical evidence verifying that teacher collaboration directly and consistently affects teacher instructional practices or student achievement.

Collaboration and Teacher Practices

Teachers working together in schools come in a variety of formats ranging from working to reach consensus about how to handle specific problems that arise to serving on school

committees that oversee and monitor facets of the school's operations. Although these practices can be beneficial to the school as a whole, they don't represent the systematic collaboration that transforms the school into a professional learning community. In a study that examined collaboration among teachers in a Professional Development School, findings indicated that collaboration in a learning community was of absolute importance in the shift from teaching in traditional isolation. Teachers in the study expressed a particular appreciation for opportunities to access other professionals and experts in their field (Snow-Gerono, 2005). Individuals come to a learning community having their own personal experiences and knowledge levels they must then define each other's actions and coordinate their activities so that they "fit together". It is this shared history and culture that sets the stage for meaningful collaborative work to occur (Dooner, Mandzuk, & Clifton, 2008). The National Education Association (2006) reported that high performing schools have three things in common: they promote cultures of collaboration, encourage staff interaction and professional communities, and cultivate stakeholder relationships stating that teacher collaboration removes barriers to student learning.

In addition to improved teaching practices in collaborative school cultures, there is also evidence that exchanges of resources occur more frequently when teachers participate in social relationships with other teachers (Moolenaar et al., 2012). Teacher collaboration can occur in a variety of formats. Goddard, Goddard, and Tschannen-Moran (2007) outlined several possible configurations for collaboration: 1) collaboration between regular and special education teachers for the purpose of meeting the needs of disabled students, 2) collaboration among teachers working in the same departments, 3) collaboration between groups of teachers who were brought together to solve specific problems, and 4) collaboration between teachers for the purpose of discussing professional work. When special education teachers and general education teachers

who have their own expert knowledge of a student elect to work in isolation, the student's learning becomes fragmented and the child's needs often go unmet (Goddard, Goddard, & Tschannen-Moran, 2007). Pounder (1998) investigated teachers from like departments or grade levels who participated in collaborative teams and found that participating teachers experienced increases in skill variety, knowledge of individual student learning, parent communication, and knowledge of the instructional practices of other teachers (Goddard et al., 2007). Research conducted by Tschannen-Moran, Uline, Hoy, and Mackley (2000) revealed that grouping teachers together to collaborate for the purpose of solving specific problems enabled individual teachers to assess their own personal problem solving processes alongside that of the group, and to identify ways to improve the robustness of their personal problem solving skills (Tschannen-Moran, Uline, Hoy, & Mackley, 2000). Research conducted by Putnam and Borko (1997) verifies that if teachers are expected to effectively adapt and modify their instructional practices to meet changing goals of reform, they must be given opportunities to collaborate. The researchers argued that just as we wouldn't expect students to learn science without allowing them to interact with others who know science, teachers shouldn't be expected to transcend their current view of teaching practice without ideas or ways of thinking about teaching, learning, and subject matter from other educators (Putnam & Borko, 1997).

Collaboration and Student Learning Outcomes

Hauseman and Goldring (2001) stated that teachers are central to successful reform in schools and that collaboration can lead to greater knowledge about theories, methods, and instructional practices; what is not verified is which changes in instruction due to collaboration are in fact responsible for improved student learning. Moolenaar, Sleegers, and Daly (2012) found that teachers working in collaborative cultures experience collective efficacy which in turn

results in broadened skill sets and heightened confidence levels related to the collective promotion of student learning. Their study conducted in 2012 was one of the first studies conducted for the purpose of examining connections between teacher collaboration, collective efficacy, and student achievement (Moolenaar et al., 2012).

Goddard, Goddard, and Tschannen-Moran (2007), along with Moolenaar, Sleegers, and Daly (2012), argued that any relationship between collaboration and student achievement most likely occurs indirectly due to a positive affect collaboration may have on teaching practices (Goddard et al., 2007; Moolenaar et al., 2012).

Differentiated Instruction

The use of differentiated instructions in all classrooms was the third stage in the PLC implementation process at Angel Primary School. After data was collected through the administration of the formative assessment at all grade levels and the PLC had the opportunity to meet for the purpose of analyzing data and planning instruction, teachers were able to implement differentiated instruction in their own classrooms in order to address the strengths and weaknesses identified through the data analysis. The differentiated instruction used by teachers was discussed and planned during collaboration. Because differentiated instruction followed collaboration and collection and analysis of formative assessment data, the differentiated instruction section of this review of literature directly follows the section pertaining to collaboration.

Once the differentiated instruction that was planned during collaboration was implemented in each classroom, the process began another cycle. Common formative assessments were administered, data was collected, collaboration was conducted in order to

analyze data and plan differentiated instruction, and differentiated instruction was delivered to meet needs identified during collaboration.

Student populations in schools across the country are becoming increasingly diverse. This shift can be attributed to both societal changes and changes in education. Classrooms are now inclusive of students from diverse cultural backgrounds, students from non-English speaking backgrounds, students with specific identified disabilities, and advanced students. As a result teachers are compelled to modify and tailor their teaching to a wide range of needs (Subban, 2006). Differentiated instruction is an educational philosophy designed to acknowledge student differences related to backgrounds, readiness levels, language, interests, and learning profiles and to allow teachers to respond appropriately to specific student needs (Tomlinson, 1999).

The differentiated instruction model initially emerged through the work of Russian psychologist, Lev Vygotsky (1896–1934). Numerous researchers have studied the role of Vygotsky (1986–1934) in instructional enhancement, classroom change, and redevelopment (Blanton, 1998; Flem, Moen, & Gudmundsdottir, 2000; Goldfarb, 2000; Kearsley, 1996; Riddle & Dabbagh, 1999; Rueda, Goldenberg, & Gallimore, 1992; Shambaugh & Magliaro, 2001; Tharp & Gallimore, 1988). Vygotsky's Zone of Proximal Development (ZPD) emphasized that the teacher's role in student learning is one of purposeful instruction, a mediator of activities and substantial experiences allowing the learner to attain a level of potential development linking that which is known by the student to that which is unknown (Blanton, 1998; Rueda et al., 1992). The implications of Vygotsky's theory suggested the use of the differentiated instruction model as an instrument to facilitate the learning process (Subban, 2006).

In addition to increased student diversity as a rationale supporting the need for a new and more progressive educational model, other factors — including brain research, research pertains to multiple intelligences, and theories concerning learning styles — also point towards a need to transform instructional practice. Quite simply, individuals don't all learn in the same way (Fischer & Rose, 2001; Giles & Hargreaves, 2006; Green, 1999; Mulroy & Eddinger, 2003). Guild (2001), Mulroy and Eddinger (2003), and Tomlinson (2001, 2002) argued that it is necessary to take into account the vast differences among students in a classroom, acknowledging each student's strengths while accommodating their limitations. Contemporary classrooms should accept and build on the basis that learners are all essentially different.

Three related concepts that necessitate differentiation of instruction are suggested by brain research: 1) the learning environment must be safe and non-threatening; 2) students must be appropriately challenged; content should not be too difficult or too easy; 3) much should be encouraged to make meaning through association (King-Friedrichs, 2001; Tomlinson & Kalbfleisch, 1998).

Strong, Silver, and Perini (2001) stated that it is apparent that an awareness of different learning styles is a significant tool to understanding differences and assisting with student development. Models of education based on learning styles have equipped teachers with the ability to plan their lessons and their curriculum, bearing in mind how students learn best (Strong et al., 2001).

Gardner's (1999) theory of multiple intelligences focuses on eight intelligences that learners may access as tools for learning and problem solving. Considering multiple intelligences when planning and implementing instruction rather than heavily relying on a single intelligence creates opportunities for all students to learn (Gardner, 1999).

Tomlinson (1999, 2001, 2003) identified three elements that guide differentiated instruction: content, process, and products. Content involves what students need to learn. All students are given equitable access to the same content, but are allowed to master this in different ways. Process refers to the ways in which content is taught, through tiered activities and the use of flexible grouping by student readiness, interest, or learning profile (Corley, 2005; Tomlinson & Eidson, 2003). Products entail how students demonstrate understanding and whether they can actually apply new knowledge. Students are typically given a choice of products from which to demonstrate mastery including reports, oral presentations, group discussions, books, and games. Tomlinson and Eidson (2003) expanded the elements that guide differentiation to include two additional elements: affect, meaning how students link thought and feeling in the classroom; and learning environment, meaning the way the classroom feels to a student and functions. Guidelines that make differentiation an attainable instructional model were also identified by Tomlinson and Eidson (2003). When applied to instructional practices the following guidelines support effective differentiated instruction resulting in improved student learning:

- Teachers must identify key concepts necessary to increased student achievement and must then make these concepts the focus of instruction ensuring that all students gain powerful understandings that will be the foundation to their future learning.
- Teachers must use assessment before, during, and after instruction to identify and address student needs.
- Instructional practices must emphasize critical and creative thinking.
- Teachers must develop lessons that engage all learners and vary tasks across students, groups, and within instruction.

- Teachers must use pre-assessment information to balance teacher-assigned and student-selected tasks. This balance should shift and vary from student-to-student, group-to-group, and class-to-class.

A synthesis of research completed by Pearl Subban (2006) supported a shift to a new exemplar for modern education that recognizes differentiated instruction as a model that can be implemented to meet the varied instructional needs of students.

Differentiated Instruction and Teacher Practices

Subban (2006) identified educational trends reflective of significant changes in student populations from two to three decades ago that require educators to make changes in their educational practices. Subban discussed the fact that although there is ample support for the differentiated instruction model through testimonials, anecdotes, and classroom examples, there is a lack of empirical validation and evidence that verifies the effectiveness of the model and proves that teachers are in fact differentiating instruction in their classrooms to meet the varied needs of their students. Tomlinson presented factors that impeded successful implementation of differentiated instruction in the school that included fear of change and the unknown, lack of a common definition of the practice, and poor administrative support.

Differentiated Instruction and Student Learning Outcomes

Connor, Morrison, and Katch (2004) observed first grade instruction in 42 classrooms, measured 108 target children, and linked teachers' instructional practices to growth in student achievement. Instruction was described as either explicit (when children's attention was focused on strategies) or implicit (when skills were allowed to develop more naturally) and coded as either teacher-managed or child-managed (i.e., independent learning, freedom of choice). Change in the above dimensions was measured to investigate whether teachers adapted their

routines over the course of the year as children's skills changed. Findings indicated that students achieved more growth when their instruction was matched to their needs. Connor, Morrison, and Petrella (2004) employed a similar design for third grade children (explicit/implicit; teacher-managed/child-managed; word-level/higher order; and time) and measured for reading comprehension. Findings again indicated that growth was maximized when children were provided instruction to match their needs. Stager (2007) examined the effectiveness of differentiated instruction, specifically tiered activities, in increasing student knowledge in regard to fractions. Students were grouped according to ability, instructed by the teacher, and asked to complete activities at the appropriate level in their groups. While all students made significant gains in their mean test scores, not all achieved mastery. Though forming homogeneous groups allowed students to attain the same knowledge and to meet measurable success, further study is warranted to deepen understanding of how differentiated instruction can support mastery by all. Tomlinson (1995) conducted a case study examination of one school's district mandate for differentiated instruction and found the continuum of differentiation to include: 1) no differentiation, where the class worked as a whole with group pacing; 2) micro-differentiation, where questions were sometimes adjusted in discussions, individuals sometimes encouraged to take assignments further, some allowance for small group work, and occasional adjustments made for individual students; and 3) macro-differentiation, where a philosophy of student differences was articulated, variable pacing practiced, variations were planned, flexible groups were consistently used, and grading reflected individual growth.

Research pertaining to differentiated instruction has identified several barriers:

- Will differentiated instruction meet the needs of all learners?
- Teacher opposition toward modifying instruction.

- Teachers perceiving differentiated instruction as a passing fad.
- Concern about time to plan and implement.
- Concerns about classroom management.

In addition to the above barriers, research also showed that differentiated instruction may only impact student learning in the area of math. There were also concerns pertaining to the level of fidelity that differentiated instruction was being implementing. Subban (2006) discussed research indicating that teachers weren't considering student interests, learning profiles, or cultural differences in their planning and instructional practices; rather, they were planning and delivering their lessons like they would in a "tracked" classroom (Blozowich, 2001). Intense and ongoing professional development is critical in successful implementation.

Three intersecting principles emerged from the literature:

- Reciprocal social interaction and a collaborative student/teacher relationship accommodate learning.
- The learning context is a social context that supports the development of cognitive functions and communication skills.
- Brain research, multiple intelligence research, and learning styles research indicates that students learn at higher levels when they are encouraged to associate newly obtained information with existing knowledge.

Summary

The review of literature confirms that there is a vast and varied research base pertaining to the relationship between PLCs and teaching and student learning; however, there is very little evidence showing which components and practices of PLCs are actually responsible for positive change or verifying that PLCs can function as a vehicle for change in schools. To inform this

study, this literature was divided into three main areas of research. The first section provides a history and definition of PLCs, the relationship between PLC practices and instructional practices, and the relationship between PLC practices and student achievement. Each subsequent section is representative of one component that emerged through the review of the literature. These sections are Collaboration, Common Formative Assessment, and Differentiated Instruction.

Professional Learning Communities

The theoretical and empirical literature presented in this review of literature verify that the PLC model can serve as a vehicle for positive change and can lead to improved student learning when specific components are in place and utilized by PLC members. The research shows that a shared vision of learning for all students, collective inquiry to guide continuous improvement efforts, and structured teacher collaboration are PLC components that are critical to the process of improving instruction and increasing student achievement (Barlow, 2005; Blankstein et al., 2008; DuFour et al., 1998, 2004, 2006; Hord, 2004; Hord & Sommers, 2008; Schmoker, 2005). However, additional research is needed if schools are to fully understand how to implement and sustain effective PLCs in order to bring about these changes. Studies are needed that more directly examine the relationships among PLCs and teacher collaboration, analysis of student work, teaching practices, and ultimately student learning (Vesico, 2008) as well as studies that qualitatively analyze the nature of the work.

Collaboration

Research suggests that collaboration leads to the sharing of knowledge, breaks down teacher isolation, collectively empowers teachers, develops a shared language and understanding, and promotes a culture of professional respect. As noted by Barlow (2005),

> The right kind of continuous, structured teacher collaboration improves the quality of teaching and pays big, often immediate, dividends in student learning and professional morale in virtually any setting. Our experience with schools across the nation bears this out unequivocally. (p. 76)

Research further suggests that providing teachers with structured opportunities to collaborate with one another improves the quality of teaching in the classroom and promotes student learning. Although a wide range of research has been done to investigate the relationship between teacher collaboration in schools and instructional practices and ultimately student achievement by researchers around the world (Daly & Finnigan, 2010; Daly et al., 2010; de Lima, 2007; Earl & Katz, 2007; Hallinger, 2003; Hite et al., 2010; Hite et al., 2005; Moolenaar et al., 2011; Moolenaar et al., 2012; Pil & Leana, 2009; Veugelers & Zijlstra, 2002), little empirical evidence verifying that a consistent relationship exists.

Common Formative Assessment

Studies examining the relationship between formative assessment and improved student achievement conducted by Ainsworth and Vieght (2006), DuFour et al. (2006), DuFour and Stiggins (2009), and Fisher and Frey (2009, 2007) all supported the development and use of common formative assessments within. In a comprehensive meta-analysis of available research, Black and Wiliam (1998) discussed findings indicating strengthening the practice of formative assessment and providing professional develop for teachers on the administration and use of such assessment to inform their instruction often results in significant and often substantial gains in student learning. Empirical knowledge examining the effect of common formative assessments on student achievement is just beginning to be gathered and is therefore more limited (Fisher & Frey, 2007, 2008, 2009).

Differentiated Instruction

In PLCs differentiated instruction is built upon what is learned from formative assessment results. Because of the increased diversity of student populations in classrooms, it is no longer appropriate or effective to provide the same "factory" style instruction to all students. Teachers must meet the needs of students from diverse cultural background, students from non-English speaking backgrounds, students with specific identified disabilities, and students that are more advanced academically (Subban, 2006). Differentiated instruction is an instructional model that is designed to enable teachers to meet the needs of all learners (Tomlinson, 1999).

The differentated instruction model was initially introduced as a dimension of Vygotsky's (1896–1934) Zone of Proximal Development. It has been researched by numerous experts since (Flem, Gudmundsdottir, & Moen, 2000; Gallimore & Tharp, 1990; Moore; Morrison, Goldfarb, & Lanken, 2010; Riddle & Dabbagh, 1999; Rueda, Goldenberg, & Gallimore, 1992; Shambaugh & Magliaro, 2001). In addition to increased student diversity as a rationale supporting the need for a new and more progressive educational model, other factors including brain research, research pertaining to multiple intelligences, and theories concerning learning styles also point towards a need transform instructional practice (Fischer & Rose, 2001; Giles & Hargreaves, 2006; Green, 1999; Mulroy & Eddinger, 2003).

According to Hall (2004), differentiation is recognized to be a compilation of many theories and practices. The differentiated instruction model has been explored in a variety of studies conducted by a variety of researchers; however, the review of research indicates that the model in its entirety is lacking empirical validation and future research is warranted (Huffman & Hipp, 2003).

Additional research is needed to determine if there is in fact a relationship between differentiated instruction and improved instructional practices as well as increased student achievement and what aspects of the differentiated model are part of any relationship that may exist.

The purpose of the study was to investigate the structures and processes of the PLC at Angel Primary School. The framework chosen to guide this study emerged through the work of Shirley Hord (1997, 2004) and contains five principles of PLCs identified by Hord. Hord's principles of PLCs include 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions. This framework was chosen for this study because the components of the framework shared several relationships with the PLC practices implemented at Angel Primary School: formative assessment, collaboration, and differentiated instruction. The principles from the framework will serve as a guide in determining the nature of the PLC practices being utilized school-wide at Angel Primary, possible relationships between the PLC practices and teaching and learning in the school, and in identifying any additional practices being used that could possibly be connected to changes in instruction and student achievement. Figure 3 reflects Hord's (1997, 2004) Five Principles of PLCs and the PLC practices implemented at Angel Primary School.

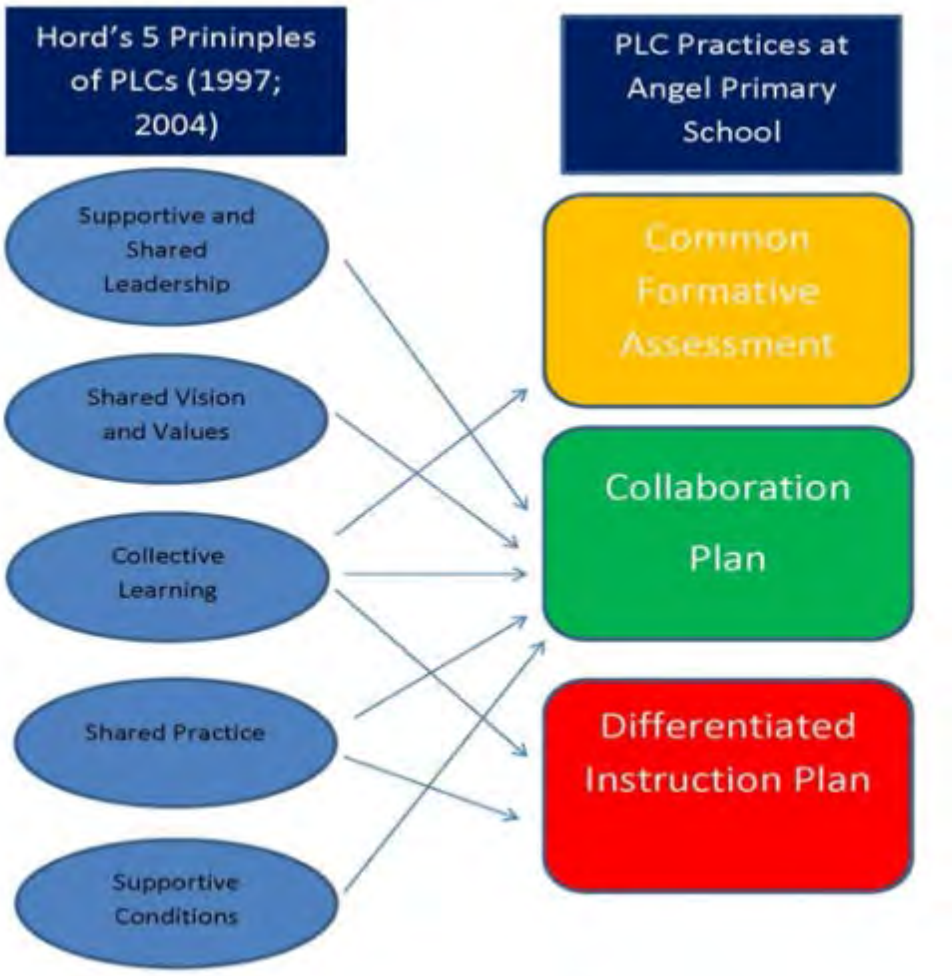


Figure 3. Connections between Hord's Five Principles of Professional Learning Communities and the Professional Learning Community Practices Implemented at Angel Primary School

CHAPTER III: METHODOLOGY

Purpose of the Study

The researcher intends to determine the degree to which teaching practices h changed as a result of the implementation of PLC practices and if the practices have improved student learning outcomes achievement. This study was designed to investigate how teachers working within a Professional Learning Community (PLC) utilize the components and structure of the PLC to improve their instructional practices and ultimately increase student achievement.

There is now an urgent need for America's teachers to find ways to collectively build their personal knowledge, widely share this knowledge, and transform personal knowledge into cohesive professional knowledge among colleagues for the purpose of meeting the needs of all students; PLCs as a vehicle for change can make this possible (Chokshi & Fernandez, 2005; Vescio et al., 2008b). In order for this to take place it is important to identify elements and practices that are commonly included in the PLC implementation process.

The framework of the case study was based on the five attributes of PLCs identified through the work of Shirley M. Hord (1997, 2004): 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions.

The NCTAF (2010) research verified that in order to accomplish the two goals set out by Plan 2020 — 1) assuring that every student is college and career ready and 2) closing achievement gaps for low-income students and children of color — major changes in education

will have to take place. The researchers stated that curriculum, instruction, and assessment designed for the past won't be adequate to meet these goals and that the most critical area in need of change is that of the actual teaching profession itself (Carroll et al., 2010). Carroll, Fulton, and Doerr (2010) maintained that by functioning as PLCs, teachers were able to bridge gaps between their instruction and student achievement. Hord (1997, 2004) argued that if certain PLC practices are in place the PLC can be effectively used as a vehicle for positive change in schools. The purpose of the study is to investigate the structures and processes of the PLC at one Angel Primary School.

Research Design

For this study the researcher approached the research questions through the use of a mixed methods case study design. Mixed methods design involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to answer research questions. Qualitative methods are ideal for measuring pervasiveness of "known" phenomena and central patterns of association, including inferences of causality. Quantitative methods allow for identification of previously unknown processes, explanations of why and how phenomena occur, and the range of their effects (Pasick et al., 2009). Triangulation of data through mixed methods serves to strengthen and offset any potential weaknesses of using either quantitative or qualitative approach. Quantitative scores on an instrument from many individuals could serve to offset the weaknesses of qualitative documents from fewer people and in-depth qualitative observations of a few people by providing detailed information about the context or setting in which individuals provide information when the quantitative data cannot (Creswell, 2002; Creswell & Clark, 2007).

The mixed methods approach is advantageous in that it:

- Provides a focus on research questions that call for real-life contextual understandings, multi-level perspectives, and cultural influences.
- Employs rigorous quantitative research assessing magnitude and frequency of constructs and rigorous qualitative research exploring the meaning and understanding of constructs.
- Utilizes multiple methods- surveys, questionnaires, interviews, and student learning data (BAS).
- Intentionally integrates or combines these methods to draw on the strengths of each. (Johnson, Onwuegbuzie, & Turner, 2007)

The decision to use the case study design was based on the premise that case studies can provide rich descriptive illustrations of what is actually happening in a particular program or event, and the analysis of this depiction can provide plausible explanations for those events or outcomes. This case study was based on the design research of Stake (1995) and Yin (2003) in order to ensure that the phenomena are thoroughly explored through multiple lenses. Case studies is a research design that can be used to deepen knowledge related to multiple types of phenomena and allows for a holistic and meaningful investigation of characteristics of real-life events (Stake, 1995; Yin, 2003). Patterns and themes transforming data into information were analyzed which allowed the new information to be used and applied as knowledge (Rossman & Rallis, 2010). Creswell (2002) described the transformation of information into knowledge as an active, constructivist theory of learning in which an understanding of the social phenomena is established through direct experience, description, and interpretation.

Yin (2003) categorized case study types as explanatory, exploratory, or descriptive and also differentiates between single, holistic case studies and multiple-case studies while Stake (1995) identifies case study types as intrinsic, instrumental, or collective. Because this case study was used to describe an intervention or phenomenon and the real-life context in which it occurred, the nature of a newly implemented PLC, and the affects the PLC practices have had on instruction in a primary school, the case study was determined to be descriptive in nature.

The qualitative data used in this case was collected through in-depth interviews that were conducted in the spring of 2014 and additional documents and artifacts. The quantitative data was collected from a PLC survey, a questionnaire, and student learning data. The survey was based on a PLC assessment developed by Hall and Hord (1987). The survey was administered at the beginning of the 2013–2014 school year through the use of Qualtrics. The questionnaire used was the Stages of Concern Questionnaire which was administered at the beginning, middle, and end of the 2013–2014 school year in a paper-pencil format. The student learning data was generated by the Fountas and Pinnell Benchmark Assessment System (BAS) which is administered to all students at Angel Primary School at the beginning and end of each school year.

Research Questions

The research questions that guided this study were:

1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?

Setting

The study allowed the researcher to develop an understanding that the meanings individuals had constructed from their own particular school contexts, settings, and participation in the PLC is based on human interaction in the setting that these relationships occur. The school used in this study was selected due to its development of PLC practices specifically designed to positively affect teaching and learning in primary schools, the one year pilot of those practices, and the decision to implement the practices school-wide following the success of the pilot.

Angel Primary School is located on an active duty military installation in Alabama. The installation is primarily a helicopter training facility. Students who are enrolled at Angel Primary School are dependents of military personnel. All schools within Angel Primary School districts, as well as all other schools nationwide and abroad that are located on military instillations, operate under the policies, procedures, and governance of one education organization.

All schools in the district with Angel Primary School are on a five-year accreditation cycle. During a 2011/2012 accreditation visit the accrediting team issued a required action asking the school to implement a systematic process to analyze data, to increase rigor and student engagement, and to create a plan that facilitates collaboration both vertically and horizontally. At around the same time that the required action was issued, funding was received to support PLCs in our schools. The Angel Primary School PLC made the decision to utilize the funding for a PLC to form a community that would conduct research and develop all that was needed to

address the AdvancEd required action. The first step taken by the Angel Primary School PLC was to conduct research related to the three expectations of the required action. The newly formed PLC analyzed the studies of Tomlinson, DuFour, Fullan, Hord, and Black. Three common themes emerged through the analysis of research: the utilization of common formative assessment to frequently collect data that could be used to guide instruction, collaboration designed to analyze student learning data and plan interventions, and differentiated instruction.

The PLC at Angel Primary School used the research as a guide in designing a common formative assessment instrument to assess comprehension strategies; character, setting, problem, solution, summarizing, and making inferences. The PLC also developed a plan for using differentiated instruction to teach the strategies assessed by the common formative assessment and a PLC collaboration plan. The new assessment instrument and an emphasis on differentiated instruction and collaborative planning were implemented as a pilot in the classrooms of PLC members during the 2012–2013 school year. During the pilot year PLC members administered the common formative assessment five times, conducted collaboration meetings after each administration to examine student learning data and to plan instruction, and after each collaboration session they returned to their classrooms and implemented differentiated instruction. Positive influences on teaching practices throughout the pilot were identified through analysis of collaboration agendas and minutes and through discussions that took place during collaboration. Positive changes in student learning outcomes throughout the pilot were identified through collaboration agendas and minutes and the analysis of common formative assessment and Benchmark Assessment System data. Because of the positive outcomes, the decision was made to implement school-wide during the 2013–2014 school year. This school-wide implementation is the focus of this research project.

Role of the Researcher

The researcher knew and was able to demonstrate the characteristics and components of what was being studied (Guba & Lincoln, 1994). Because of the researcher's awareness of the subtleties of the data collected and insight into the meaning of the data came from professional interactions with the phenomenon, potential biases needed to be acknowledged and addressed (Creswell, 2002). One concept utilized to address the researcher's personal interest and involvement in a study can be described as epoche, or bracketing, as a concept through with the researcher eliminates their own experiences from the study to the highest degree possible in order to take a fresh perspective of the phenomenon being investigated (Giorgi & Giorgi, 2008). Giorgi (2008) and Tufford and Newman (2012) asserted that in order for the researcher to discover meanings in the data, it is necessary to maintain an attitude that is open enough to allow unexpected meanings to occur. It is proposed that the concept of bracketing should be on the researcher's mind throughout the research process and not only restricted to data collection and analysis (Tufford & Newman, 2012). Tufford and Newman (2012) identified four strategies for achieving bracketing:

- The *Strategy for Mental Preparation* leads the researcher through a series of questions that evaluate their ability to conduct a phenomenological study.
- The *Strategy for Deciding the Scope of the Literature Review* aids the researcher in determining what they may already know about the topic that may influence how the review of literature is conducted. The researchers stated that the more uncertain the researcher is about whether the literature review should be conducted the better.

- The *Strategy for Planning Data Collection* prepares the researcher to maintain curiosity through the interview and observation processes and to allow the participants to freely express themselves.
- The *Strategy for Planning Data Analysis* encourages researchers to suspend their predispositions that may cause them to distort or filter information during data analysis. The use of Colaizzi's data analysis method is recommended for this strategy in order to determine if their answers to questions need further validation and to ensure that the researcher has not misinterpreted the data.

An examination of research pertaining to bracketing increased knowledge and deepened the understanding needed by this researcher to ensure validity in case study research. The researcher in this study applied the strategy of reflexivity and practiced the realization of an honest evaluation of her own values and interests that may potentially impinge upon the research.

Participants

Upon receiving Institutional Review Board approval from the University and the Education Organization in which Angel Primary School is housed, letters of consent to potential participants were distributed. The letters included the three research questions guiding the study and an overview of the five attributes of PLCs identified by Shirley M. Hord (1997, 2004): 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions. Participants were individuals who participated in the one year pilot of the common formative assessment and PLC practices at Angel Primary School as well as those involved in the school-wide implementation. Creswell, Hanson, Plano, and Morales (2007) described participants in a case study as

individuals who are easily accessible, willing to participate and provide information, and who are able to contribute to knowledge to the phenomena being explored. Research also maintained that participants may be sited at a single location (Creswell, Hanson, Plano, & Morales, 2007). Purposeful sampling was the data collection strategy used in this study because the participants were selected based on their potential to facilitate an understanding of the phenomenon central to the study. Tables 1 and 2 identify the participants in the study.

Table 1

Participants Involved in the One Year Pilot and School-Wide Implementation

Teacher	Years of Experience
PLC Facilitator/Gifted Teacher – B.L.	6
PLC Member/Reading Specialist – D.M.	23
PLC Member/First Grade Teacher – L.I.	25
PLC Member/Kindergarten Teacher – K.C.	18

Table 2

Participants Involved Only in School-Wide Implementation

Teacher	Years of Experience
CSI Team Member/First Grade Teacher – W.W.	10
CSI Team Member/First Grade Teacher – L.J.	6
First Grade Teacher – K.S.	14
First Grade Teacher – A.K.	37
First Grade Teacher – C.D.	22
CSI Team Member/Kindergarten Teacher – R.D.	18
CSI Team Member/Kindergarten Teacher – A.S.	6
Kindergarten Teacher – R.S.	39
Kindergarten Teacher – V.S.	28
Kindergarten Teacher – N.M.	23
Kindergarten Teacher – K.S.	6
Pre-K Teacher – M.C.	22
Pre-K Teacher – D.E.	28
Pre-K Teacher – M.L	30
CSI Team Member/Pre-K Special Education Teacher – M.G.	14
Reading Specialist – K.N.	30

Trustworthiness

In order to ensure rigor in qualitative research, researchers rely on models that address trustworthiness and are appropriate to mixed methods case study design. The model used for this study was proposed by Lincoln and Guba (1994) and is based on the identification of four aspects of trustworthiness: credibility, transferability, dependability, and confirmability.

Credibility

Credibility ensures that what was reported in this case study reflects the true perceptions of the participants (Guba & Lincoln, 1994). Credibility was added to this research through the triangulation of data from multiple sources.

Transferability

Transferability allows the reader to make generalizations that my clarify their own personal experiences and develop connections with the research (Stake, 1995). Explicitly detailed descriptions are necessary in order for research to be transferable to other (Creswell, 2002). The detailed descriptions should immerse the participants in the research and bring their experiences to life. Creswell (2002) argued that explicitly detailed descriptions are critical in providing data that can devise and extend theory.

Dependability

Dependability occurs when the researcher creates and audit trail that another researcher is able to follow. This can be accomplished through journaling or memoing to detail the research process.

Confirmability

Confirmability ensures that that the data collected and analyzed in the study presents an refers to the idea that the data should represent true perspectives of the participants without any

bias from the researcher (Morrow, 2005). The researcher used epoche or bracketing to help in establishing confirmability. Ongoing comparative analysis and coding also helped maintain objectivity by tying the research process closely to the data. Memoing and the audit trail allowed the researcher to keep track and organize thoughts and ideas, and was useful in achieving confirmability. Triangulation of data was an additional measure that helped ensure confirmability in this study.

Ethical Conditions

It is critical that researchers remain sensitive to ethical considerations throughout the entire research process (Creswell et al., 2007). Sensitivity was maintained as the researcher conducted work in the field site, involved participants in the study, gathered personal perception data, analysis of data, discrete dissemination of findings, and use of the participants' time (Creswell et al., 2007). The researcher utilized bracketing in order to minimize personal influence on the case study. Bracketing is a means by which researchers put aside their own personal knowledge, beliefs, values, and experiences related to the study in order to describe the participants experiences as accurately as possible.

This study is in compliance with institutional ethical standards in conducting research. The researcher successfully completed all Collaborative Institutional Training Initiative requirements and received approval to conduct the study from the Institutional Review Board from both Auburn University and the Federal Education Organization in which Angel Primary School is housed. Prior to the collection of any data, letters of consent were distributed to all potential participants. The letters detailed the purpose and scope of the study. Data collection began once the letters of consent were completed by volunteer participants and returned to the researcher. All participants were notified in writing and verbally that their participation in any

surveys, questionnaires, or interviews was completely voluntary and that they were free to remove themselves from the study at any time if they so desired. Participants were also informed that there were no foreseeable risks related to the study and that their anonymity would be maintained throughout the study and in the written report generated from the completion of this research. All data collected from the interviews, surveys, and questionnaires were stored in either a password protected computer or a locked file cabinet located in the researchers classroom.

Limitations

Stake (1995) defined generalizability and in particular natural generalizability as the degree to which research findings are used to gain understanding of a specific situation and then utilize that understanding to make sense of similar situations. Because this case study deals with the perceptions, knowledge, and experiences of only one group of educators it is difficult to ascertain whether conclusions drawn from this particular case apply elsewhere. The results of the study may or may not be generalizable because we can never know whether the case we have investigated is representative of the wider body of "similar" instances.

Additional limitations include the fact that the study only investigated PLCs in a Pre-K through First Grade primary school, the participants included only teachers from one primary school who have worked within the PLC process, and the teachers participating in this study are required to participate in PLC training and to fully participate in PLC team meetings.

Significance of the Study

Teachers, as learners themselves, should have opportunities to participate in collaborative practices that equip them to model collaborative learning and the construction of knowledge that is central to expected competencies of the 21st century. However, these opportunities are often

not available which leads to fragmentation in their own instructional practices and failure to meet the needs of their students. It is known that by functioning as PLCs teachers are able to bridge gaps between their instruction and student learning, but the reality is most teachers are still planning and teaching in isolation (National Commission on Teaching and America's Future, 2010). There is now an urgent need for America's teachers to find ways to collectively build their personal knowledge, widely share this knowledge, and transform personal knowledge into cohesive professional knowledge among colleagues for the purpose of meeting the needs of all students, PLCs as a vehicle for change can make this possible (Chokshi & Fernandez, 2005; Vescio et al., 2008a). In order for this to take place it is important to identify elements and practices that are commonly included in the PLC implementation process.

The study is significant due to the fact that it is designed to test the qualities and practices of effective Professional Learning Communities (PLC). Findings will validate the utilization of PLC practices in Pre-K through First Grade classrooms and will further develop the knowledge base and deepen the understanding of ways the practices can be implemented to ensure Continuous School Improvement and highest student achievement.

Data Collection

One characteristic of mixed methods case study research design as noted by Creswell (2007) is the use of multiple data sources. The researcher explained that multiple forms of data are collected, such as interviews, observations, and documents then all the data are reviewed and organized into categories or themes that cut across all data sources(Creswell & Clark, 2007). Yin (2003) explained that using evidence from a variety of sources in a way that encourages convergent lines of inquiry increases construct validity and allows the researcher to triangulate data in order to identify themes across all sources.

This case study utilized four data collection procedures to address the four research questions. However, all four data sources were not used for all four questions. Rather, combinations of data sources were used for each individual question in order to achieve triangulation. Data sources were: 1) a survey based on a modified version of the Professional Learning Community Rubric (PLC-R) developed by Hall and Hord (2006) titled the Angel Primary School PLC Survey and administered electronically through Qualtrics; 2) the Stages of Concern Questionnaire (SoCQ); 3) interviews, additional documents and artifacts; and 4) Student Learning data generated by the Fountas and Pinnell Benchmark Assessment System (BAS).

Case study research is known to utilize multiple data sources for the purpose of enhancing data credibility (Johnson & Onwuegbuzie, 2004). Each data source can be described as a piece of the puzzle that contributes to the researcher's understanding of the entire phenomenon (Baxter & Jack, 2008). Surveys and interviews were used to collect and organize qualitative descriptive data for the purpose of answering these guiding questions.

PLC Survey

A PLC survey based on Hall and Hord's (2003) PLC assessment rubric and revised by Hipp and Huffman (2010) was administered at the beginning and end of the 2013/2014 school year. The original Hall and Hord (2003) PLC assessment was designed to identify and measure the perceptions of school leadership, staff, and stakeholders related to the five principles of PLCs identified by Hord (1997). An initial field test of the original PLC assessment involved the responses of seventy-six educators to forty-four questions for the purpose of determining the importance and relevance of each response to PLCs in schools (Olivier, Hipp, & Huffman, 2003). Response choices included in this initial field test were High, Medium, and Low. The field test participants rated ninety-eight percent of the items highly relevant with only one item

receiving a medium rating. A second field test was conducted using forty-five statements due to the fact that the developers felt that it was necessary to divide one of the original statements into two separate statements. The response choices in this field test were in the format of a four-point Likert scale: 4 = Strongly Agree, 3 = Agree, 2 = Disagree, and 1 = Strongly Disagree.

Psychometric testing of the Hord survey instrument was established using Cronbach's (1951) alpha test for internal consistency. The usability, reliability, and validity tests conducted on the Hord (1997) survey met or exceeded criteria for use in academic research (Hord, 1997). The Hipp and Huffman (2003) revised version was assessed for reliability and construct validity. Using a factor analysis to determine convergent validity along with Cronbach's alpha, the survey instrument was found to be reliable yielding satisfactory internal consistency between 0.83 and 0.93. The widespread use of the instrument provided an opportunity to review the dimensions for internal consistency. A recent analyses of this diagnostic tool has confirmed internal consistency resulting in the following Cronbach's alpha reliability coefficients for factored subscales (n = 1209): Shared and Supportive Leadership (.94), Shared Values and Vision (.92), Collective Learning and Application (.91), Shared Personal Practice (.87), Supportive Conditions-Relationships (.82), and Supportive Conditions-Structures (.88). This assessment tool has gone through construct validity (Expert Study and factor analysis) and has yielded satisfactory internal consistency for reliability.

The five principles of PLCs identified by Hord (1997) which were included in the original Hall and Hord (2003) PLC assessment were interwoven into the survey used for this study. The PLC survey used in this study included 45 total forced-choice Likert-type questions and was conducted online using Qualtrics. For the purpose of this study, the Angel Primary School PLC Survey was used to collect data related to Research Question One: What factors

facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

Stages of Concern Questionnaire (SoCQ)

The SoCQ was administered two times during the 2013–2014 school year, at the beginning and at the end. Since its development in the 1970s, researchers, evaluators, and change facilitators have been using the SoCQ to assess teacher concerns about new programs and practices. The SoCQ is one of three dimensions of the Concerns-Based Adoption Model (CBAM) developed under the leadership of Shirley Hord and Gene Hall and published by Southwest Educational Development Laboratory (SEDL). The SoCQ contained thirty-five items representing seven stages of concern that address the intensity of the feelings and perceptions of individuals involved in the implementation of a new innovation.

The SoCQ has a set of scales to prepare numerical and graphical analyses to represent participants' perceptions (Hall, 1977). The 35 items contained in the SoCQ are set up as a Likert scale with scores that represent each stage ranging from 0–Irrelevant, 1–2 = Not True of Me Now, 3–5 = Somewhat True of Me Now, and 6 = Very True of Me Now. The 35 response questions are aligned to a specific stage of 0–6. Questions 3, 12, 21, 23 and 30 are aligned to stage 0. Stage 1 includes questions 6, 14, 15, 26 and 35. Stage 2 includes questions 7, 13, 17, 28 and 33. Stage 3 includes questions 4, 8, 16, 25 and 34. Stage 4 includes questions 1, 11, 19, 24 and 32. Stage 5 includes questions 5, 10, 18, 27 and 29. Finally, Stage 6 includes questions 2, 9, 20, 22 and 31. The calculations of these scores show percentiles and relative intensity of concerns.

The developers of the SoCQ investigated the validity of the SoCQ by examining how the scores on the seven scales related to one another (George, Hall, & Stiegelbauer, 2008). They

also looked at how the scores on the SoCQ scale related to other variables. These variables were inter-correlation matrices or measures of how the analysis results matched as the scale scores were calculated to show raw scale scores and percentile scale scores as well as judgments by interviewers about participant concerns based on the interview data.

Additionally, the validity tests examined the differences in groups of participants and the changes that occurred over time as the tests began and were concluded. In 1974, a series of two-year cross-sectional and longitudinal studies were conducted on eleven educational innovations to show validity of the SoCQ. The instrument has a high internal reliability with estimates of internal consistency (alpha coefficients) ranging from .64 to .83 with six of the seven coefficients being above .70. Stage score correlations ranged from .65 to .86 with four of the seven correlations being above .80.

The selection of items to be included in the SoCQ occurred through the elimination of items from a large item bank until 35 items remained. The SoCQ for this study was administered in paper/pencil format and data was input and analyzed using SPSS. Data generated by the SoCQ were used to answer Research Question Two: As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, the Collaboration Plan and Differentiated Instruction?

Fountas and Pinnell Benchmark Assessment System (BAS)

Yin (2003) explained that common characteristics of case study research are the combination of data collection techniques such as interviews, observation, questionnaires and documents and the use of both qualitative and quantitative data collection and analysis methods. One numerical form of data was used in this study. The BAS is a one-on-one, comprehensive assessment to determine independent and instructional reading levels and for placing students on

the Fountas and Pinnel Text Level Gradient (A-Z). This assessment is more formative in nature and is administered at the beginning and end of each school year. The data from this assessment enables teachers to determine where students are in relation to meeting grade level standards in reading at the beginning of the year and to measure yearly progress at the end of the year.

Through the use of the BAS, the student's independent reading level is identified using a formula that considers a combination of reading accuracy, fluency, and comprehension. To determine the level of reliability and validity of the BAS, field testing was conducted with 498 students enrolled in a socioeconomically and ethnically diverse group of 22 schools from five geographic regions across the U.S. Determinations of each school's socioeconomic status were made using federal guidelines for categorizing low-, middle-, and high-SES schools.

Field testing results indicated that the fiction and nonfiction books in the Fountas and Pinnell Benchmark Assessment System (BAS) progressed in difficulty as the levels increased from Levels A–Z. In addition, field testing also confirmed that students' developmental reading levels are similar for fiction and nonfiction texts at each level on the F&P Text Level Gradient. Test-retest reliability refers to the consistency of students' scores across tests. To measure the test-retest reliability of Fountas and Pinnell Benchmark Assessment System, the students' reading scores on the fiction series were correlated with their scores on the nonfiction series. In general, test-retest results should exhibit a reliability coefficient of at least .85 for an assessment's information to be considered stable, consistent, and dependable. Coefficients for the BAS level book series are as follow: Book Series A-N – .93, Book Series L-Z – .94, all Books (A-Z) – .97. The test-retest results verify that the Fountas and Pinnell Benchmark Assessment System is a reliable reading assessment.

In determining validity, the BAS was compared to Reading Recovery. There was a strong relationship between the reading accuracy rates of Fountas and Pinnell Benchmark System I fiction and nonfiction books (Book Levels A–N), and the accuracy rates of the texts used for assessments in Reading Recovery, with correlations of .94 for fiction and .93 for nonfiction. This is an important finding because the Reading Recovery Text Level Assessment, like the Fountas and Pinnell Benchmark Assessment System, assesses decoding, fluency, vocabulary, and comprehension. These results reinforce the validity of the Fountas and Pinnell Benchmark Assessment System 1 program. There was a moderate association between the Benchmark System 2 (Book Levels L-Z) fiction and nonfiction books and other literacy assessments.

The criteria for determining BAS Independent Levels for levels A-K is the highest level a student can read with 95–100% accuracy and excellent or satisfactory comprehension. Criteria for determining Independent Levels for BAS levels L-Z is the highest level a student can read with 98–100% accuracy and excellent or satisfactory comprehension. For a kindergarten student to be considered to be considered as *Meeting the Grade Level Standard* the student must read at BAS Level C or above at the end of the school year. For a first grade student to be considered as *Meeting the Grade Level Standard* the student must read at BAS Level I or above at the end of the school year.

BAS reading level data is generated in terms of alphabetic letters. The lowest possible level is an A and the highest level is Z. Students who are unable to read and comprehend at a Level A are given a 0 as their reading level. For the purpose of this study, the alphabetic reading levels were assigned numeric values. The number 1 was correlated with Level A, number 2 with Level B, number 3 with Level C and so on until the number 26 was correlated with Level Z. For

a kindergarten student to be considered as *Meeting the Grade Level Standard* using the numeric values rather than the alphabetic level values the student must score a 3 or above at the end of the year. For first grade students to be considered as *Meeting the Grade Level Standard* using the numeric values the student must score a 9 or above at the end of the year. Data generated by the BAS were relied upon to answer Research Question Three: Have student learning outcomes changed with the implementation of the PLC practices of common formative assessment, collaborative planning and differentiated instruction?

Interviews

Yin (2003) stated that interviews are strong sources of case study data because they focus specifically on the case study topic and proofed perceived causal inferences. Interviews in case study research allow for extensive items in each stage of knowledge to be produced (Kvale & Brinkmann, 2009).

Semi-structured, open-ended interviews were used in this study to allow the researcher to probe beneath the surface in a way that generates a holistic understanding of the interviewee's point of reference and perceptions related to PLCs at Angel Primary School. Interview questions were all open-ended in order to obtain thick descriptions of the PLCs components being implemented. Interview questions were organized according to the relationship the questions had with Hord's (1997, 2004) principles of PLCs and NCATF (2010) essential elements. The questions were developed and correlated based on the following.

The first interviews were conducted with the four members of the Angel Primary School PLC. These educators were interviewed first due to their being a part of the one-year pilot of the common formative assessment and PLC practices during the 2012–2013 school year and also led the school-wide implementation. These interviews allowed for data to be collected that was rich

in knowledge and perceptions of individuals who had actually developed and fine-tuned the PLC practices to be implemented at Angel Primary School and had utilized the practices with fidelity in their own classrooms for longer than one year.

The second set of interviews included three Pre-K teachers, six Kindergarten teachers, five First Grade teachers, one Pre-K Special Education teacher, one Reading Specialist, one Speech and Language Pathologist, one Guidance Counselor, and one Educational Technologist. Two of the Kindergarten teachers, two of the First Grade teachers, and the Pre-K Special Education teacher were also members of the Continuous School Improvement Team. This information was important to this stage of the interview process due to the fact that the Continuous School Improvement Team was involved in making the decision to implement the PLC practices school-wide.

All interviews were conducted in a one-to-one format during the participant's planning time or during scheduled time at the end of the school day. Each participant was given a consent form and was made aware of their right to decline to answer any of the questions asked in the interview and to withdraw from the interview at any point if they so desired. Interviews were audiotaped and transcribed. Atlas.ti was the software program that was used to organize and code data collected from interviews and additional documents and artifacts. The software allowed for multilevel and overlapping coding which was beneficial to the researcher because two sets of a priori codes were used. The first code set included the Five Principles of PLCs identified by Hord (1997, 2004): Shared and Supportive Leadership, Shared Values and Vision, Collective Learning and Application, Shared Personal Practice, and Supportive Conditions-Relationships/Structures. The second code set represented the three PLC practices implemented

at Angel Primary School: Common Formative Assessment, Collaboration Plan, and Differentiated Instruction.

Additional Documents and Artifacts

Creswell (2007) encouraged individuals conducting case study research to include new and creative data collection methods. In order to achieve an in-depth, holistic picture of the case, Yin (2003) recommended multiple forms of data collection including documents and archival records. Additional documents and artifacts used in this study include PLC meeting agendas, Continuous School Improvement team meeting minutes and agendas, staff meeting minutes and agendas, anecdotal records, collaboration calendars, and collaboration meeting minutes.

Summary

This descriptive mixed-methods case study investigated the nature of PLC implementation at Angel Primary School and how the utilization of PLC practices has changed instructional practices and student learning. The setting for the study was Angel Primary School which is a Pre-K through First Grade school that serves children of active duty military members and is located on a military instillation. Participants included teachers who had been part of the original PLC at Angel Primary School and had participated in a one-year pilot of PLC practices in their own classrooms as well as teachers who first experienced the use of PLC practices during the school-wide implementation. Multiple data sources were collected including questionnaires, surveys, interviews, and student learning data.

Chapter IV will present the results and findings of this case study.

CHAPTER IV. RESULTS

Introduction

This mixed methods case study was conducted at a DoDEA primary school located in Ft. Rucker, AL. Angel Primary School serves students in Pre-K through First Grade who are children of active duty military personnel. The study was designed to examine the PLC elements identified by the leadership team at Angel Primary School. Through research on PLCs the faculty at Angel Primary piloted the project during the 2012–2013 year and implemented it school-wide during the 2013–2014 school year. By focusing on the 2013–2014 implementation year of the PLC, the present research project expected to offer a snapshot of what had occurred at the school as the faculty engaged in its PLC change initiative. The change initiative focused on three elements of PLC's: Common Formative Assessment, the Angel Primary Collaboration Plan and Differentiated Instruction.

Purpose of the Study

The purpose of this study was to determine the degree to which instructional practices have changed as a result of the implementation of PLC practices and if the practices have improved student learning outcomes. This study was designed to investigate how teachers working within a Professional Learning Community (PLC) utilize the components and structure of the PLC to improve their instructional practices and ultimately increase student achievement.

Research Questions

The research questions that guided this study are:

1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?

Descriptive Statistics

The Community

The Army Aviation Center, Fort Rucker, Alabama, is located in the southeast corner of Alabama. Fort Rucker is approximately 80 miles south of Montgomery, the capital of Alabama, and 20 miles northwest of Dothan, home of the National Peanut Festival. Florida's Gulf Coast lies 80 miles to the south. The communities of Enterprise, Daleville, and Ozark are west, south and east of the post, respectively and serve as the three main gates.

The current mission of the Army Aviation Center is to develop the aviation force for its worldwide mission. This includes developing concepts, doctrine, organization, training, leader development, material, and soldier requirements. The Army Aviation Center at Ft. Rucker also provides resident and nonresident aviation maintenance, logistics and leadership training in support of the total force and foreign nations for the sustainment of joint and combined aviation operations. All Army Flight Training has taken place at Fort Rucker since 1973, making it the

Army Aviation's centerpiece. Air Force helicopter pilots have trained at the base since 1971. Fort Rucker instructors teach U.S. and foreign aviators everything from initial rotary-wing courses to advanced courses in aviation safety. Operational units on the post include the 1st Aviation Brigade handling Army Aviation training, and the USAF 23rd Flying Training Squadron for the training of Air Force helicopter pilots.

Fort Rucker supports a daytime population of about 14,000, including about 5,100 service members, 6,400 civilian and contract employees, and 3,200 military family members residing on post. This post supports about 14,500 retirees. Major commands on Fort Rucker include U.S. Army Garrison Fort Rucker, U.S. Army Aviation Warfighting Center, U.S. Army Combat Readiness Center, U.S. Army Warrant Officer Career Center, U.S. Army Aviation Technical Test Center (ATTC), Aviation Center Logistics Command (ACLC), U.S. Army Aeromedical Center, U.S. Army Aeromedical Research Laboratory, U.S. Army School of Aviation Medicine, and U.S. Army Air Traffic Services Command (ATSCOM).

The School

Angel Primary School is located on Ft. Rucker military installation in Alabama. Students who are enrolled at Angel Primary School are dependents of military personnel. All schools in the districts that Angel Primary School is in as well as all other school nationwide and abroad that are located on military instillations operate under the policies, procedures, and governance of one education organization.

The school building consists of six self-contained, open areas, which are called pods. The four-year-old program comprises one of these pods with three teachers and three aides. Kindergarten has two pods, each with three teachers and three aides. First grade classes are housed in three pods. Each first grade pod has two teachers. The school building also houses a

large cafeteria, a principal's office, a school improvement office, a guidance suite, a speech and language resource room, two special education rooms, a nurse's office, and a gifted education classroom. In addition, the school has two computer labs, two reading support rooms, a media center, a music room, and indoor gymnasium, a Spanish department, and various storage areas.

Angel Primary School is fortunate to have a principal, a registered nurse, a computer technologist, a Spanish teacher, a music teacher, a gifted education teacher, a physical education teacher, a guidance counselor and a speech teacher. All are full-time employees. The Primary school also has three Pre-Kindergarten teachers, six Kindergarten teachers, six first grade teachers, two Special Education teachers and two Instructional Support teachers. As noted on the teaching certificates, all members of the teaching staff are certified and working within their field of expertise. Educational aides assist teachers in Pre-Kindergarten, Kindergarten and Special Education. Support personnel consist of two secretaries and one Special Education secretary and building maintenance personnel.

Teachers in every grade level work in a cooperative and collaborative environment. The very nature of the pod setting lends itself to teamwork. As seen on the master schedule, each pod has a common planning period every day. This allows the teachers in each area to work as a professional team. There is no teaching in isolation because there are no isolated classrooms. This has been advantageous to our teachers as well as our students. Teachers have the opportunity daily to discuss current teaching practices, share ideas, dissect data and provide true differentiated instruction. Special area teachers are also provided a common planning period every day so that they too can develop practices that further the mission and purpose.

The teaching staff at Angel Primary School is comprised of highly trained and qualified teachers. The school system provides professional development training throughout the school

year for the teachers. On Wednesdays, the children are dismissed early so that our faculty can participate in on-site staff development/training. Staff members are required to maintain a yearly professional development folder. These folders are maintained in-house and are reviewed throughout the school year by the professional development team. On average Angel Primary School teachers have 15.6 years of experience and educational aides have 15.9 years of experience.

Angel Primary School adheres to a developmentally appropriate child-centered instructional program. The alignment of the curriculum with appropriate assessment for learning practices has led to a strong, well-balanced program. Instruction at Angel Primary School is standards driven. These standards consist of both content and performance standards. The school is comprised approximately of 242 Caucasian students, 27 African American students, 2 Asian students, 2 Native American, 4 Pacific Island students, 42 multi-race students, and 6 who declined to state race (see Table 3).

Table 3

Enrollment at Angel Primary School by Race

Race	Pre-Kindergarten	Kindergarten	1st Grade
Caucasian	69	95	76
African American	10	9	8
Asian	2	0	0
Native American	0	0	0
Pacific Islander	1	1	2
Multi-National	12	16	13
Declined to Answer	3	2	1

Students in grades kindergarten and first are full-day students. The Pre-Kindergarten students consist of two sessions per teacher. Kindergarten has the highest enrollment of all grade levels. Table 4 reflects a higher number of males than females in Pre-K and first grade with a higher number of female in kindergarten.

Table 4

Enrollment at Angel Primary School by Gender and Grade Level

Gender	Pre-Kindergarten	Kindergarten	1st Grade
Male	54	55	56
Female	45	68	47
Total	99	123	103

Due to the transient lifestyle of military students, Angel Primary School has a higher mobility rate than the typical public school. The mobility rate at Angel Primary School falls between 50% and 60% yearly. The mobility rate is caused primarily by a change in duty station or deployment. For those families who remain at Ft. Rucker during a deployment, support groups are provided for the children and spouses.

Participating Teachers

Twenty certified teachers were represented in this case study. The teachers were selected because of their involvement in the school-wide implementation of the three PLC practices: Common Formative Assessment, Collaboration Plan, and Differentiated Instruction. In addition, each participant took part in all professional development related to the implementation of the PLC practices and all were active members of the PLC through the entire school year.

Table 5

Teacher Demographics

Participant	Gender	No. Years Teaching	Years in GA/ALA	Years in Current Position
1	F	22	18	3
2	F	30	21	7
3	F	28	24	21
4	F	14	4	4
5	F	10	3	2
6	F	30	25	20
7	F	18	3	2
8	F	6	1	1
9	F	37	37	13
10	F	6	5	1
11	F	28	24	21
12	F	39	30	30
13	F	23	23	19
14	F	14	4	4
15	F	22	3	1
16	F	23	23	4
17	F	25	21	8
18	F	6	4	2

Participant total years of experience ranged from six to thirty-nine. The number of years that the participant group has worked in the school district in which Angel Primary School is located ranged from one to thirty-seven and the number of years the participant group has worked in their current position ranged from one to thirty.

Timeline

All schools within the district in which Angel Primary School is located are on a five-year accreditation cycle. During a 2011/2012 accreditation visit, the accrediting team issued a required action asking the school to implement a systematic process to analyze data, to increase rigor and student engagement, and to create a plan that facilitates both vertical and horizontal collaboration. Through vertical collaboration teachers would have opportunities to work with colleagues who teach at the grade levels above and below their own. Horizontal collaboration would allow teachers to work and plan with teachers across their own grade level.

At the same time that the required action was issued, funding was received to support PLCs in our schools. The Angel Primary School made the decision to utilize the funding for a PLC to form a community that would conduct research and develop all that was needed to address the AdvancEd required action. The first step taken by the PLC at Angel Primary School was to conduct research related to the three expectations of the required action.

The newly formed PLC analyzed the studies of Tomlinson (1995, 1999, 2011), DuFour (2006), Fullan (2002), Hord (1997, 2004), and Black (2006), and through the study of the research three common themes emerged: the utilization of common formative assessment to frequently collect data that could be used to guide instruction (Black & Wiliam, 1998, 2009) , collaboration designed to analyze student learning data and plan interventions (S. Hord, 2004; S. M. Hord, 2004), and differentiated instruction (Tomlinson, 1995, 1999). The Angel Primary

School PLC used the new knowledge gained from the research to develop a common formative assessment that was specifically designed for each grade level in order to ensure that it was developmentally appropriate. The review of research also increased PLC members' awareness of the critical role collaboration (S. Hord, 2004; S. M. Hord, 2004), and differentiated instruction (Tomlinson, 1995, 1999) play in effective PLCs leading to the development of a collaboration plan as well as a differentiated instruction plan. The formative assessment, collaboration plan, and differentiated instruction plan were piloted by Angel Primary School PLC members during the 2012/2013 school year and were then implemented as a school-wide initiative during the 2013/2014 school year. The school-wide implementation is the focus of this study.

Data Collection Instruments

This mixed methods case study utilized a variety of data collection instruments. Mixed methods design involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to answer research questions (Creswell & Clark, 2007).

Table 6 shows which data collection instruments were specifically used to answer each individual research question. Mixed methods design involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to answer research questions (Creswell & Clark, 2007). This mixed methods case study utilized a variety of data collection instruments and techniques. Beginning of the school year (BOY) and end of school year (EOY) data was collected using the Angel Primary School PLC Survey, the SoCQ, and the Fountas and Pinnell Benchmark Assessment System (BAS). Also included as data sources were teacher interviews as well as minutes and documents from staff development meetings and grade level meetings. All forms of data collected focused on common formative assessment, the schools collaboration plan, differentiated instruction and student learning outcomes. Alignment

of research questions with data sources (Table 6) demonstrated triangulation of data and added strength to the inquiry (Cohen & Manion, 2000).

Table 6

Data Collection Instruments and Research Questions

Research Question	Data Collection Instruments
1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?	Angel Primary School PLC Survey and Interviews, Documents and Artifacts
2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?	SoCQ and Interviews, Documents and Artifacts
3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?	BAS

Angel Primary School PLC Survey

The Angel Primary School PLC Survey relied heavily on the Professional Learning Community Assessment (Hall & Hord, 1987),but was slightly modified to meet the needs of this study. The survey was administered at the beginning and end of the 2013/2014 school year through the use of Qualtrics. The statements included in the survey were categorized into representative groups:

1. Items 1–10 focus on the attributes supporting Shared and Supportive Leadership
2. Items 11–18 assess Shared Values and Vision
3. Items 19–26 determine the teachers' perceptions in regards to Collective Learning and Application.
4. Items 27–32 assess the Shared Personal Practice
5. Items 33–45 pertain to Supportive Conditions

Teachers responded to each statement in each section by choosing their responses from a four point Likert-type scale reflecting their level of agreement with the statement: Strongly Disagree (1), Disagree (2), Agree (3), and Strongly Agree (4).

Stages of Concern Questionnaire (SoCQ)

The SoCQ was developed through research conducted by Hall and Hord (1987) and the Southwest Educational Development Laboratory (SEDL). The questionnaire serves as the corner-stone of the Concerns-based Adoption Model (CBAM). The SoCQ is designed to provide a framework from which to understand the personal side of the change process by asking participants to respond to thirty-five items related to their levels of concern pertaining to new change using a 0–6 scale. The SoCQ was administered at the beginning and end of the 2013/2014 school year and included statements which would determine teacher perceptions of the PLC implementation of common formative assessment, the collaboration plan and differentiated instruction.

The stages of concern are awareness, information, personal, management, consequence, collaboration and refocusing. These stages are assigned numbers 0–6. The stages of concern were determined by the teachers selecting and circling numbers on a Likert-type scale ranging

from 0–7, with 0 being Irrelevant, 1–2 Not True, 3–5 Somewhat True, and 6–7 Very True. Table 7 provides a description of each of the stages of concern.

Table 7

Descriptions of Stages of Concern

0	**Unconcerned**: Little concern about or involvement with the innovation.
1	**Informational**: General awareness of the innovation and interest in learning more detail about it.
2	**Personal**: Uncertain about the demands of the innovation, adequacy to meet those demands, and personal role with the innovation.
3	**Management**: Attention is focused on the processes and tasks of using the innovation and the best use of information and resources.
4	**Consequence**: Attention focuses on impact of the innovation on students in immediate sphere of influence.
5	**Collaboration**: Focus is on coordination and cooperation with others regarding use of the innovation.
6	**Refocusing**: Focus is on exploring ways to reap more universal benefits from the innovation, including the possibility of making major changes to it or replacing it with a more powerful alternative.

Each stage of concern includes five questions of the thirty-five total question. Table 8 correlates each questionnaire item with the specific stage of concern with which it is aligned.

Table 8

Questionnaire Items Related to Each Stage of Concern

	Stages of Concern						
	0	1	2	3	4	5	6
Questionnaire Items	3	6	7	4	1	5	2
	12	14	13	8	11	10	9
	21	15	17	16	19	18	20
	23	26	28	25	24	27	22
	30	35	33	34	32	29	31

Fountas and Pinnell Benchmark Assessment System (BAS)

Student learning data were generated through the administration of the BAS. The BAS is a summative assessment that is administered to all students at Angel Primary School. BAS data was collected and analyzed from beginning and end of year administrations during the 2013/2014 school year.

Interviews and Additional Documents and Artifacts

Structured interviews, including questions pertaining to participant demographics, as well as five questions related to the research questions were conducted in the spring of the 2013/2014 school year. Data collection instruments for this study also included documents and artifacts in the form of staff development, grade level meetings, and collaboration meeting agendas and minutes along with other communications related to the implementation of the PLC at Angel Primary School. Interview data were categorized and coded for analysis.

Interviews were conducted with ten of the eighteen teachers. The researcher stopped at twelve interviews because saturation had occurred. The interviewee group was represented a cross section of the participant group. A minimum of two teachers from each grade level at Angel Primary School were interviewed along with teachers serving as support staff, i.e. reading coach, special education teacher, and gifted education teacher.

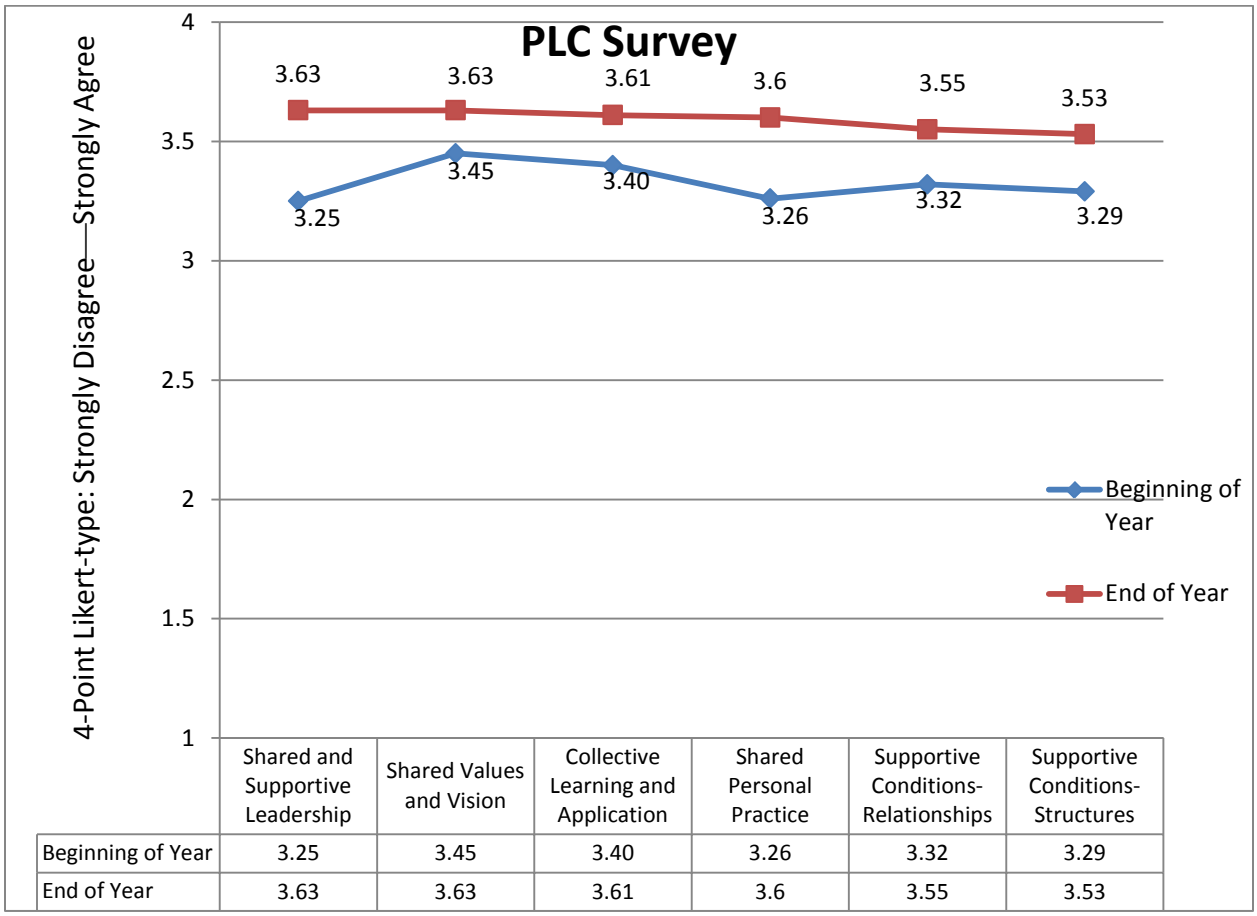
Atlas.ti was the software program used to organize and code data collected from interviews and additional documents and artifacts. The software allowed for multilevel and overlapping coding which was beneficial to the researcher because two sets of a priori codes were used. The first code set included the Five Principles of PLCs identified by Hord (1997, 2004): Shared and Supportive Leadership, Shared Values and Vision, Collective Learning and Application, Shared Personal Practice, and Supportive Conditions-Relationships/Structures. The second code set represented the three PLC practices implemented at Angel Primary School: Common Formative Assessment, Collaboration Plan, and Differentiated Instruction. For the purpose of reporting participant interview responses the teachers are referred to as P3, P4, P8, P9, P10, P12, P13, P15, P16, and P18.

Results

Research Question 1: What factors facilitated and/or hindered PLC implementation of common formative assessment, the collaboration plan, and differentiated instruction?

Angel primary school PLC survey. The Angel Primary School PLC Survey was administered twice during the 2013/2014 school year. A beginning of year (BOY) administration took place in August 2013 and an end of year (EOY) administration was completed in May 2014. Angel Primary School PLC Survey data collected from the BOY served as baseline data in determining the initial state of the school-wide implementation of the

PLC practices of: Common Formative Assessment, the Collaboration Plan and Differentiated Instruction. The EOY administration of the Angel Primary School PLC Survey uncovered several key elements pertaining to learning outcomes at the end of the first full school-wide implementation year and culminated in statistically significant change in the PLC during the implementation year. As seen in Figure 4, collective participant responses in all six principles fell between agree and strongly agree of the four-point Likert-type scale. Means for all six principles are reported in Figure 4.



	Shared and Supportive Leadership	Shared Values and Vision	Collective Learning and Application	Shared Personal Practice	Supportive Conditions-Relationships	Supportive Conditions-Structures
Beginning of Year	3.25	3.45	3.40	3.26	3.32	3.29
End of Year	3.63	3.63	3.61	3.6	3.55	3.53

Figure 4. Collective Responses for the Angel Primary School PLC Survey in each of the Six Principles – Beginning and End of Year Results

Means, standard deviations, and results of the Repeated ANOVA for BOY and EOY data for all six PLC principles combined are reported in Table 9. The difference between the Beginning of the Year Grand Mean (3.33) and the End of the Year Grand Mean (3.59) was statistically significant (p = .027) at the .05 level. Eta square accounts for 7% of the variance, or a small effect size. Because this research project was a case study of one school and not all faculty members participated in the survey (n = 12/22), the researcher chose to interpret the results with caution.

Table 9

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p values for the Six PLC Principles Addressed by the Angel Primary School PLC Survey Combined

Angel Primary School PLC Survey	Beginning of Year		End of Year		df	F	Eta Square	p
	Mean	SD	Mean	SD				
	3.33	.47	3.59	.41	17	5.88	.269	.027

Means, standard deviations and results of the BOY and EOY Repeated ANOVA were reported for each of the six PLC principles addressed in the Angel Primary School PLC Survey. These were reported in Table 10 as Shared and Supportive Leadership, Shared Values and Vision, Collective Learning and Application, Shared Personal Practice, Supportive Conditions-Relationships, and Supportive Conditions-Structures. The correlations, Eta Square between the BOY and the EOY of the Angel Primary School PLC Survey ranged from .104 to .316. This was interpreted as a small to medium effect size. The principles of Shared and Supportive Leadership (p = .025), Shared Personal Practice (p = .015), Supportive Conditions-Relationships

(p = .044) and Supportive Conditions-Structures (p = .043) were statistically significant. The BOY and the EOY for two of the six principles addressed in the Angel Primary School PLC Survey were not statistically significant. Shared Values and Vision (p = .208) and Collective Learning and Application (p = .122) did not reach statistical significant. Like the overall PLC F-test, there was some degree of caution needed in interpreting the results.

Table 10

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p values for each of the Six PLC Principles Addressed by the Angel Primary School PLC Survey

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Shared and Supportive Leadership	3.25	.50	3.63	.42	17	6.12	.277	.025
Shared Values and Vision	3.45	.49	3.63	.43	17	1.73	.104	.208
Collective Learning and Application	3.40	.47	3.61	.46	17	2.67	.143	.122
Shared Personal Practice	3.26	.57	3.60	.42	17	7.39	.316	.015
Supportive Conditions-Relationships	3.32	.57	3.55	.46	17	4.80	.23	.044
Supportive Conditions-Structures	3.29	.53	3.53	.44	17	4.82	.23	.043

In interpreting the Angel Primary School PLC Survey in relation to Research Question 1, the Angel Primary School PLC became more positive as the implementation year progressed. Shared and Supportive Leadership, Shared Personal Practice, Supportive Conditions-Relationships and Supportive Conditions-Structures all changed in a significantly positive

direction, indicating that the PLC, which started at a fairly high mean in every principle, continued to increase in a positive direction. This suggested the implementation of common formative assessment, the collaboration plan and differentiated instruction may have strengthened the schools learning community.

Shared and supportive leadership. When leaders are supportive and share leadership responsibilities they plant the seeds of community and collaboration then nurture and protect the learning community as it grows (S. M. Hord, 2004). Although the school administrator at Angel Primary School did not serve as a formal participant in this study, there were components of the school-wide implementation of the PLC practices at the school that were directly linked to school leadership.

The results of the Repeated ANOVA which was used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of Shared and Supportive Leadership was statistically significant. The BOY mean for this principle was 3.25 with an SD of .50 while the EOY mean was 3.63 with and SD of .42 resulting in a P value of .025.

Table 11

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p values for the Principle Shared and Supportive Leadership

	Beginning of Year		End of Year		*df*	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Shared and Supportive Leadership	3.25	.50	3.63	.42	17	6.12	.277	.025

In evaluating shared and supportive leadership, all (EOY) means were higher than (BOY) means. Table 12 reflects overall participants' beliefs about each of the 11 statements in the Principle Shared and Supportive Leadership.

Table 12

Participants' to PLC Principle: Shared and Supportive Leadership

Statement #	BOY Mean	EOY Mean	Statement
1.	3.24	3.65	Staff members are consistently involved in discussing and making decisions about most school issues.
2.	3.18	3.59	The principal incorporates advice from staff to make decisions.
3.	3.18	3.65	The staff has accessibility to key information.
4.	3.29	3.71	The principal is proactive and addresses areas where support is needed.
5.	3.18	3.53	Opportunities are provided for staff to initiate change.
6.	3.24	3.71	The principal shares responsibility and rewards for innovative actions
7.	3.24	3.35	The principal participates democratically with staff sharing power and authority.
8.	3.24	3.76	Leadership is promoted and nurtured among staff.
9.	3.24	3.71	Decision-making takes place through committees and communication across grade and subject areas.
10.	3.06	3.53	Stakeholders assume shared responsibility and accountability for student learning without evidence of imposed power and authority.
11.	3.65	3.76	Staff members use multiple sources of data to make decisions about teaching and learning.

Interview data indicated that shared and supportive leadership was a critical factor in the implementation process of the PLC practices at Angel Primary School. When questioned during the interview process P12 stated:

> The high expectations of the school leadership motivated me to give 100% to the implementation of the common formative assessment, collaboration plan, and differentiated instruction with fidelity. I know I speak for others in saying that the development of an assessment calendar which held us to specific windows of time for the administration of the common formative assessment at the beginning, middle, and end of the school year and the creation of the assessment and differentiated instruction kits that contained everything needed for implementation were critical to successful implementation. School leadership and the work of the original PLC were responsible for accomplishing that.

When leaders are serious about sharing leadership and supporting other developing leaders, they lead by following and serving and encourage others to share the responsibilities of leadership (Sigurðardóttir, 2010). Through the interview process the researcher also discovered that the school administrator fully supported and empowered the development of the PLC, the pilot year and the implementation year at Angel Primary School. Participant P8, who was a member of the 2012/2013 pilot team as well as being a leader during the 2013/2014 school-wide implementation, explained:

> We were given complete autonomy while developing the common formative assessment, collaboration plan and differentiated instruction. We kept our principal and superintendent in the loop about what we were doing so they knew the work was research based and aligned with our school improvement plan, but our professionalism and depth

> of knowledge were respected. We were given the freedom to develop the best practices we could, test the practices in our classrooms, come together to analyze the results of our test runs, and make necessary modifications. This action research led to the best final product we could develop which is now being implemented school-wide. We have had continued leadership support.

When school leaders have leadership they not only provide necessary support for collaboration, they also work alongside teachers in the collaboration process asking questions, investigating, inquiring, and seeking school improvement solutions (Sigurðardóttir, 2010) . Shared and Supportive Leadership was also evident in meeting agenda and minutes. The school principal developed staff meeting agendas based on needs identified by PLC faculty as well as on the feedback from the Continuous School Improvement (CSI) Team. A collaboration meeting minute template was developed by the principal and the CSI Team. A teacher participating in collaboration meetings, P13, shared:

> Through the development of the collaboration meeting minute template school leadership helped us stay focused throughout our collaboration sessions. We clearly understood the expectations of our school leaders and that in order to meet those expectations our priorities had to be focused on the analysis of student work and assessment results and on the planning of differentiated instruction to address needs seen in what was produced by our students. We were also able to have in-depth discussions about what was working with our instruction and what wasn't.

In addition to the school leadership being involved the in the development of tools that supported collaboration her high level of visibility throughout the building and in classrooms

was viewed as supportive in the implementation of the PLC practices. When asked to describe how the school leadership facilitated the implementation P10 stated:

> Students and teachers are very accustomed to her presence in their classrooms, in the hallways, or wherever students and teachers may be. She has set up the type of relationships where you just expect her to be in there and if not, you wonder where she is. So, she has to let us know when she is not going to be here because we are going to be looking for her. On the few days that she hasn't made it to my class I have asked, "Why didn't you come into my room today? I was doing some amazing teaching and you were not here!"

When asked how leadership and involvement was encouraged throughout the school during the implementation process P8 discussed:

> Our school leadership is very big on asking people with their input. We're involved in a whole lot of stuff I feel like…. We may brainstorm a list of things impeding us from getting [to a goal]. And then we will meet in committees and come back with something to go forward toward those goals and share that. And usually pull those into plans. We do have a lot of input; everybody does.

P12 added:

> The school leadership is good at being democratic. She very rarely exercises her authority and says, 'I am making this decision, whether you like it or not.' I don't think that I have ever seen that.

Shared personal practice. The strategy of teachers openly sharing personal instructional practice was also identified as a defining attribute of PLCs. Louis and Kruse (1995) discussed the fact that a teacher reviewing the practices of their peers is common in PLCs. The researchers

explained that shared personal practice is non-evaluative in nature, is based on a shared pursuit of individual and school improvement, and is only successful in a culture of trust and mutual respect (S. Kruse et al., 1994). The issue of teaching in isolation must be directly confronted through a formalized structure for teacher interaction in order for schools to improve teaching and learning. When given opportunities to interact, teachers build mutual respect and trust and become increasingly committed to their work (Elmore, 2000). According to Hord (1997), shared personal practice is often the last of the attributes to develop and requires a paradigm shift from the traditional practice of teaching in isolation.

The results of the Repeated ANOVA test which was used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of Shared Personal Practice was statistically significant. The BOY mean for this principle was 3.26 with an SD of .57 while the EOY mean was 3.60 with and SD of .42 resulting in a *p* value of .015.

Table 13

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p Values for each of the Principle Shared Personal Practice

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Shared Personal Practice	3.26	.57	3.60	.42	17	7.39	.316	.015

BOY and EOY means for Shared Personal Practice indicated that all seven items contributed to the higher EOY score. Teachers indicated that they felt more positively about

collaborating with colleagues, sharing ideas and using student work to guide and improve instruction. Item #3 EOY data received the highest level of agreement with a mean of 3.76 while Item #1, opportunities for staff to observe peers, and Item #2, staff member feedback related to instruction, both received the lowest mean of 3.47. Mean scores increased from the beginning of the year to the end of the year in all seven statements. Table 14 reflects overall participants' beliefs about each of the seven statements in the Principle Shared Personal Practice.

Table 14

Participants' Responses to PLC Principle: Shared Personal Practice

Statement #	BOY Mean	EOY Mean	Statement
1.	3.06	3.47	Opportunities exist for staff members to observe peers and offer encouragement.
2.	3.29	3.47	Staff members provide feedback to peers related to instructional practices.
3.	3.47	3.76	Staff members informally share ideas and suggestions for improving student learning.
4.	3.47	3.65	Staff members collaboratively review student work to share and improve instructional practices.
5.	3.12	3.53	Opportunities exist for coaching and mentoring.
6.	3.29	3.65	Individuals and teams have the opportunity to apply learning and share the results of their practices.
7.	3.12	3.71	Staff members regularly share student work to guide overall school improvement.

Participant interview responses related to change in teaching practices as a result of the implementation of the Common Formative Assessment, Collaboration, and Differentiated Instruction indicated that the PLC practice that having the greatest influence on their instruction was collaboration. This supports the relationship between the principle Shared Personal Practice

identified by Hord (1997, 2004) and improved instructional practice. Participants indicated that it was through collaboration that they were able to learn from each other how to continually improve their own instruction. P10 reported:

> Collaboration causes the teachers to improve their strategies by hearing what other teachers are doing in their own classrooms. It helps you to help your own children. Talking through what I'm doing that maybe isn't working well has led to a total change in my instructional strategy related to specific skills. There are some things I will never teach the same way again just because a fellow teacher opened my eyes to a new and better way.

Participants also reported that collaboration in itself had evolved. Several participants (P3, P8, P10, P15, and P18) expressed that collaboration initially focused on basic planning but by the end of the first full implementation year of the PLC practices the focus had shifted towards a rigorous alignment of teaching practices to content standards through an on-going analysis of student learning data.

In response to a question pertaining to how and to what degree the implementation of the PLC practices had positively affected her instruction and the learning of her students' learning P9 stated:

> I feel like through this year long process we have all learned a great deal about ourselves, our students, and our school. The discussions we have been able to have during collaboration sessions have fundamentally changed our instructional practices. When instructional practices improve it is inevitable that student learning will also improve. We have seen increases in student achievement through the assessments we have given over the course of this school year as compared to the same data from previous years

when the PLC practices were not in place. Regular, structured collaboration opportunities have been the cornerstone of this positive change. Collaboration has been the critical factor involved in making the PLC implementation a success. With all we have learned and accomplished this year, I am really interested to see what our second year of PLC implementation will be like.

Supportive conditions. Supportive Conditions determine when, where, and how school staffs collaborate for the purpose of making decisions, solving problems, and working creatively. This attribute has been defined as the most critical factor for school improvement because it provides the structures that sustains and supports the school vision and the functions of the learning community. Hord addressed two categories of supportive conditions: people capacities (Supportive Conditions-Relationships) and physical and structural conditions (Supportive Conditions-Structures). People capacities that support PLCs include highly qualified teachers, positive teacher attitudes, respect and trust among school and district level educators, supportive leadership, positive relationships among all stakeholders, and a sense of community in schools (S. Kruse et al., 1994). Among the physical and structural conditions that support PLCs are time to collaborate, structures that reduce teacher isolation, available materials and resources, school autonomy, quality staff development, and teacher empowerment (Boyd & Hord, 1994; S. Kruse et al., 1994).

Supportive conditions-relationships. The results of the Repeated ANOVA which was used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of was statistically significant. The BOY mean for this principle was 3.32 with an SD of .57 while the EOY mean was 3.55 with and SD of .46 resulting in a P value of .044.

Table 15

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p values for the Principle Supportive Conditions-Relationships

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Supportive Conditions-Relationships	3.32	.57	3.55	.46	17	4.80	.23	.044

BOY and EOY means for Supportive Conditions-Relationships indicated that all five items contributed to the higher EOY score. Teachers indicated that they felt more positively about the presence of caring relationships, a culture of trust, and a unified relationship between all stakeholders. Items #1, 2, and 3 EOY data received the highest level of agreement with a mean of 3.59 while item #4 (related to a unified effort to embed change) received the lowest level of agreement with a mean of 3.47. Mean scores increased from the beginning of the year to the end of the year in all five statements. Table 16 reflects overall participants' beliefs about each of the seven statements in the Principle Shared Personal Practice.

Table 16

Participants' Responses to PLC Principle: Supportive Conditions-Relationships

Statement #	BOY Mean	EOY Mean	Statement
1.	3.41	3.59	Caring relationships exist among staff and students that are built on trust and respect.
2.	3.35	3.59	A culture of trust and respect exists for taking risks.
3.	3.29	3.59	Outstanding achievement is recognized and celebrated regularly in our school.
4.	3.18	3.47	School staff and stakeholders exhibit a sustained and unified effort to embed change into the culture of the school.
5.	3.35	3.53	Relationships among staff members support honest and respectful examination of data to enhance teaching and learning.

Supportive conditions-structures. The results of the Repeated ANOVA used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of Supportive Conditions-Structures was statistically significant. The BOY mean for this principle was 3.29 with an SD of .53 while the EOY mean was 3.53 with and SD of .44 resulting in a P value of .043. Table 17 reflects overall participants' beliefs about each of the five statements in the principle Supportive Conditions-Relationships.

Table 17

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p Value for the Principle Supportive Conditions-Structures

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Supportive Conditions-Structures	3.29	.53	3.53	.44	17	4.82	.23	.043

Within the Principle of Supportive Conditions-Structures EOY means were higher in all items except Item #1 (Table 18). EOY data within the principle of Supportive Conditions-Structures revealed the highest reported mean to be Item #9 (mean = 3.71) pertaining to how communications systems promote a flow of information. Other items such as Item #4, the availability of appropriate technology (mean = 3.65), and Item #10, availability of needed data (mean = 3.65), indicate that teachers saw these items as improving during the implementation year.

Table 18

Participants' Responses to PLC Principle: Supportive Conditions-Structures

Statement #	BOY Mean	EOY Mean	Statement
1.	3.35	3.29	Time is provided to facilitate collaborative work.
2.	3.35	3.59	The school schedule promotes collective learning and shared practice.
3.	3.06	3.18	The school schedule promotes collective learning and shared practice.
4.	3.53	3.65	Appropriate technology and instructional materials are available to staff.
5.	3.00	3.53	Resource people provide expertise and support for continuous learning.
6.	3.47	3.53	The school facility is clean, attractive and inviting.
7.	3.24	3.59	The proximity of grade level and department personnel allows for ease in collaborating with colleagues.
8.	3.24	3.59	Communication systems promote a flow of information among staff.
9.	3.18	3.71	Communication systems promote a flow of information across the entire school community including: central office personnel, parents, and community members
10.	3.47	3.65	Data are organized and made available to provide easy access to staff members.

When asked what if any factors may have influenced the successful implementation of the PLC practices of common formative assessment, the collaboration plan and differentiated instruction, teachers responded that certain components related to the principle of Supportive Conditions-Structures were in place and helpful. They also identified missing components that resulted in some difficulties and frustration. In relation to working in a Pod setting where collaboration and peer support can take place at a moment's notice, P3 stated:

> I came in new to the school this year and sometimes I think schools take for granted that even though you are new you have taught for many years and expect you to already know what's being done and what's being implemented. I sort of had to dig some but I have

two people that I work with who make sure I know what's going on. Had I been in a self- contained classroom rather than in a pod setting where I can work so closely with my peers it would have been much more difficult to implement the expected PLC practices.

The same participant went on to add:

Training on practices for new teachers is something that many schools don't do a great job with. Look at me; I come in having taught for 25 years but when you come to a new system there still are new things and even though I've come from another school in this same district that uses the same curriculum, I think schools as whole don't do the best job with new teacher training. The training I did get helped things to go more smoothly. Again, the organization and the help of the two peers I work with made the implementation go very smoothly.

Another participant, P13, addressed factors that influenced the implementation the PLC practices as well as changes that could have made implementation go more smoothly.

The difficult part has been the time required to fully implement the practices. However, now that the kits containing resources needed for the assessment, collaboration, and planning differentiated instruction are in place and every teacher has a full set of all materials it is easier to cover all our bases through the implementation. We have everything we need to administer the common formative assessment, we have the differentiated instruction plan we can use when we plan our focused instruction, and we also collaborate to support each other and share ideas. This has made the implementation go a great deal smoother. The assessment calendar also helps. The fact that I can go

behind my desk and grab my tools when I need each item has made my implementation relatively easy.

Participants recognized that Supportive Conditions in the areas of materials, resources, and scheduling as well as in instructional personnel and school leadership is a critical principal to the successful implementation of any new innovation or initiative. School leadership expressed a willingness to evaluate factors such as scheduling and time management in order to further improve the implementation of the PLC practices the following school year.

Of the six principles included in the Angel Primary School PLC Survey, significant change did not occur from the beginning of the year to the end of the year.

Shared values and vision. Hord (1997, 2004) explained that when values and vision are developed and shared by all stakeholders, high expectations for staff work, professional development, and student learning are evident throughout the school culture. A shared vision is more than a group of individuals in agreement with a particular idea or having similar goals; it is a clear, mutual understanding of where the members of an organization desire the organization to ultimately be in the future and having knowledge of what it will take to get there. In schools where a shared vision is firmly in place, the faculty and staff view students as capable learners and work to create a culture and environment that ensures students reach their full potential (Hord, 1997). Martel (1993) maintained that schools working as professional learning communities with a shared vision are focused on total quality in life, work, and learning (p. 24).

The results of the Repeated ANOVA which was used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of Shared Values and Vision were not statistically significant. The BOY mean for this principle was 3.45 with an SD of .49 while the EOY mean was 3.63 with and SD of .42 resulting in a P value of .208.

Table 19

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p Values for the Principle Shared Values and Vision

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Shared Values and Vision	3.45	.49	3.63	.43	17	1.73	.104	.208

Collective application of learning. Collective Learning and Application of Learning is evident in schools when educators from all levels, subject areas, and departments work together to gain new knowledge that will promote student learning and highest student achievement (S. M. Hord, 2004). Louis and Kruse (1995) stated that this type of collective creativity evolves through reflective dialogue and formal and informal conversations about teaching practices and student learning. The success and sustainability of a PLC that learns collectively is influenced by the degree of school staff commitment to utilizing the talents and strengths of all members to push for a high quality of intellectual learning for both themselves and the students they teach (Newman & Wehlage, 1995). These schools move from placing emphasis on operational issues such as schedules and policy issues to focusing on areas that support school improvement. Inquiry also emerges as PLC participants learn collectively. This inquiry fosters the creation of ties that bind school teachers and leaders together as a community of learners with a set of shared ideas (Sergiovanni, 1994).

The results of the Multivariate F test which was used to compare BOY and EOY results from the Angel Primary PLC Survey indicated that change in the principle of Collective

Learning and Application were not statistically significant. The BOY mean for this principle was 3.40 with an SD of .47 while the EOY mean was 3.61 with and SD of .46 resulting in a P value of .143.

Table 20

Means, Standard Deviations, Degrees of Freedom, Eta Square, and p Values for the Principle Collective Learning and Application

	Beginning of Year		End of Year		df	*F*	Eta Square	*p*
	Mean	SD	Mean	SD				
Collective Learning and Application	3.40	.47	3.61	.46	17	2.67	.143	.122

In summary, data collected through the administration of the Angel Primary School PLC Survey pointed to practices that took place throughout the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction, which served as facilitators to the implementation as well as practices or factors that may have hindered the implementation. Facilitators and hindrances related to the principles addressed by the Angel Primary School PLC Survey were identified. Survey data indicated that a strong overall facilitator was the principle Shared and Supportive Leadership. Data from the beginning of year indicated that this was the weakest of all six principles addressed by the survey; however, by the end of the year this principle emerged as the strongest among the six. Specific facilitators within the principle Shared and Supportive Leadership included; high expectations from school leadership, strong leadership support through the implementation process, teacher autonomy and

freedom to make professional decisions, teacher empowerment, encouraged risk taking, and leadership focus on collaboration. The greatest hindrance within the principle of Shared and Supportive Leadership was the overall weakness of the practices related to this principle at the beginning of the year. A second hindrance related to Shared and Supportive leadership was the need for more time to be included in the daily and weekly schedule for formal collaboration focused on examining student work, analyzing data, and planning differentiated instruction to address student needs identified through the data analysis.

The principle Shared Personal Practices focused on the effective use of collaboration to improve teacher instruction. Facilitators related to the principle Shared Personal Practice included opportunities for collaboration among PLC members to share strategies to improve instruction, to examine student work, to apply their own learning and to share results of their own instructional practices. No hindrances related to this principle were identified.

Supportive Conditions was treated as two principles on the Angel Primary School PLC Survey, Supportive Conditions-Relationships and Supportive Conditions-Structures. Facilitators within Supportive Conditions-Relationships included; an overall supportive school culture, adequate resource personnel to support the implementation, effective communication systems, opportunities for daily collaboration due to teachers working in pods with other teachers, and professional development opportunities. Facilitators within Supportive Conditions-Structures included the availability and ease of access to more than adequate technology needed for implementation, the availability of data to all teachers, and complete, organized sets of materials needed to administer the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction available to all teachers. The most predominate hindrance related to Supportive Conditions was the amount of time necessary to implement all the PLC practices with fidelity.

Teachers' survey and interview responses indicated that more time should be set aside for formal collaboration and that the time requirement for the administration of the Common Formative Assessment may outweigh the value of the student learning data generated by the assessment.

Research Question 2: As perceived by the teachers, to what extent have teacher practices changed as a result of the implementation of the Common Formative Assessment, Collaboration, and Differentiated Instruction?

The SoCQ was designed to provide a framework from which to understand the personal side of the change process by asking participants to respond to thirty-five items related to their levels of concern pertaining to an implementation of new instructional practices. The SoCQ was developed through research conducted by Hall and Hord (1987) and the Southwest Educational Development Laboratory (SEDL) and has served as the cornerstone of the Concerns-based Adoption Model (CBAM). According to the model, innovative change in curriculum and teaching practices requires a significant amount of time and support. The model suggests for innovations such as the current research project, teacher change will take five to seven years to fully implement and embed the change in the school organization (citation). Theoretically, in the beginning, the teacher will be more concerned about how the change affects them individually and personally. As time goes by, and the innovation becomes more comfortable, the teacher will begin to explore reaching out to others, supporting the work of others and sharing what they have learned with their colleagues.

In Figure 5 the means for each of the stages of concern was reported. Interpretation suggested teachers saw the Angel Primary School PLC initiative of common formative assessment, the school collaboration plan and differentiated instruction as irrelevant (Stage 0). Teachers also wanted more information (Stage 1) and considered the innovation as something

that would affect them personally (Stage 2). Teachers were less concerned about management of the process (Stage 3) and any consequences that might occur (Stage 4). Collaborating with others (Stage 5) and refocusing to make improvements (Stage 6) were low as well. Interpretation using the ScCQ manual (citation) suggested the present pattern would be expected for teachers undergoing the beginning of an implementation of a curriculum and instructional project. Little change is visible when plotting the means over time (Figure 5).

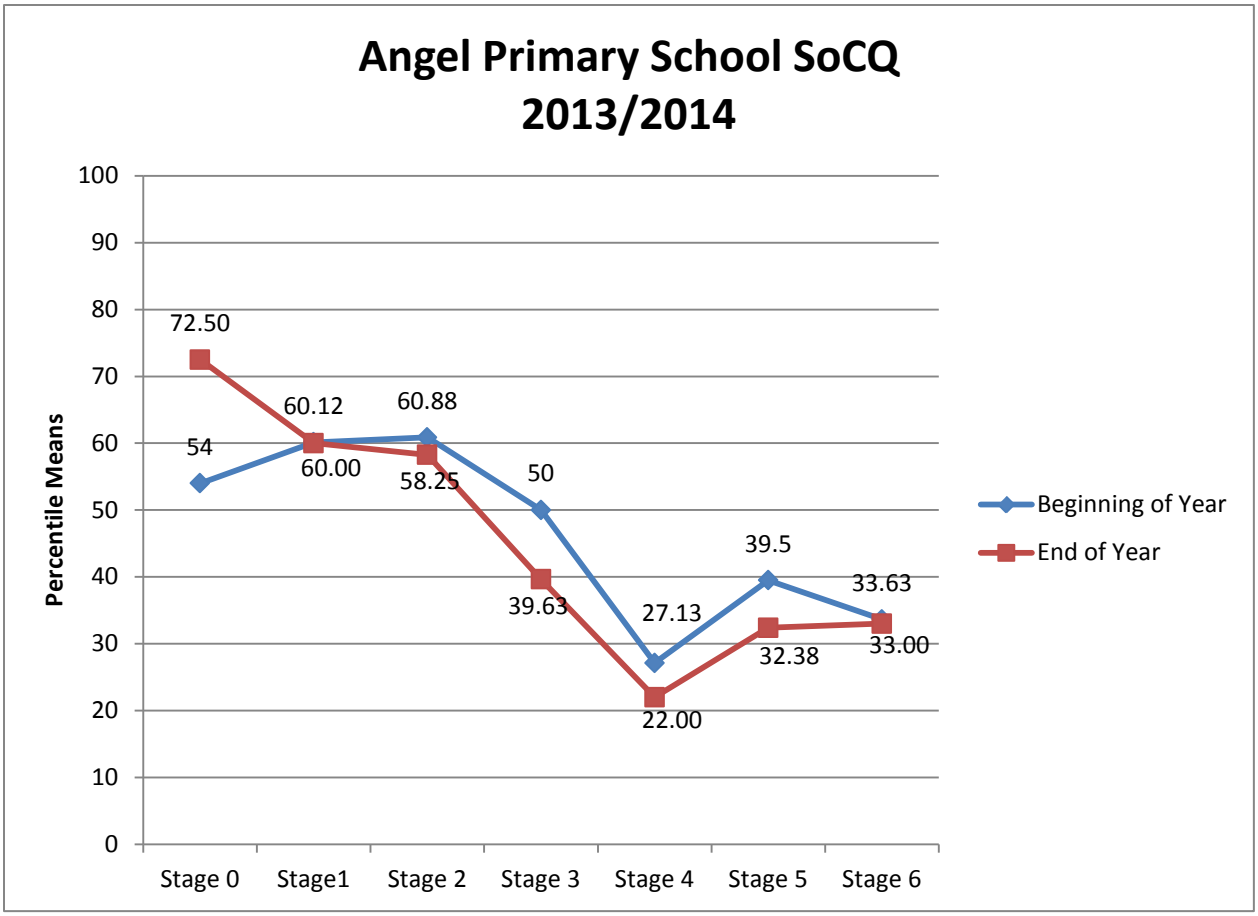


Figure 5. Mean Scores for each Stage of Concern

Interpretation of the chart as well as research of the CBAM and SoCQ suggested this pattern is normal for those beginning a new initiative. Curriculum and instructional practices take

quite a while to become firmly rooted in the organization (Vaughan, 2002). As stated earlier, it can take an individual 5–7 years to be fully vested in an innovation. After the initial implementation year, expectations are not likely to change dramatically (Vaughan, 2002). It is also possible for the beginning stages of irrelevancy to the innovation (Stage 0) and wanting more information about the innovation (Stage 1) to become more pronounced after a short time of implementation. In the present research study this appeared to be the case when comparing BOY and EOY scores.

The SoCQ results of both the pre- and post-test indicated participants still had a great need for additional information pertaining to PLC implementation of common formative assessment, the collaboration plan and differentiated instruction. Results of the SoCQ indicated teachers needed more information related to how the implementation will affect them personal and professionally. Percentile means, standard deviations, and results of the Multivariate F-test for the (BOY) and (EOY) of the seven stages addressed in the SoCQ: Stage 0-Awareness, Stage 1-Informational, Stage 2-Personal, Stage 3-Management, Stage 4-Consequence, Stage 5-Collaboration, and Stage 6-Refocusing, are given in Table 21. Eta square, Degrees of Freedom, and p values were also reported. No statistical significance was reported at any stage when comparing the (BOY) to the (EOY) SoCQ.

Table 21

Percentile Means, Standard Deviations, Degrees of Freedom, Eta Square, and p Values for the Seven Stages Addressed by the SoCQ

	Pre-administration		df	Post-administration		df	F	Eta Square	*p*
	Mean	SD		Mean	SD				
Stage 0-Awareness	54.00	35.43	17	72.50	27.22	12	2.46	.260	.161
Stage 1-Informational	60.13	23.33	17	60.00	16.36	12	.000	.000	.991
Stage 2-Personal	60.88	24.87	17	58.25	17.80	12	.064	.009	.808
Stage-3-Management	50.00	24.20	17	39.63	21.19	12	.891	.113	.377
Stage 4-Consequence	27.13	29.51	17	22.00	19.63	12	.144	.020	.715
Stage 5-Collaboration	39.50	30.51	17	32.38	24.17	12	.235	.032	.643
Stage 6-Refocusing	33.63	20.64	17	33.00	19.96	12	.004	.001	.949

In comparing the present study to other research studies using the SoCQ, similar results have been reported. The SoCQ can be reported in two ways. It can be reported as a whole group analysis, as in this study, or it can be used to report the change individual faculty are describing. In either case, change did not occur rapidly. It was very gradual and required constant support from the school administration and ongoing, comprehensive professional development (Hord, 1987). Through the interview process teachers discussed how their teaching practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction.

When asked how the implementation of the PLC practices had influenced the teaching practices of individual participants several participants reported that the collaboration plan had a strong relationship with positive change in instruction, P10 reported:

> Collaboration causes the teachers to improve their strategies by hearing what other teachers are doing in their own classrooms. It helps you to help your own children. Talking through what I'm doing that maybe isn't working well has led to a total change in my instructional strategy related to specific skills. There are some things I will never teach the same way again just because a fellow teacher opened my eyes to a new and better way.

Participants also reported that collaboration in itself had evolved. Several participants — P3, P8, P10, P15, and P18 — expressed that collaboration initially focused on basic planning but by the end of the first full implementation year of the PLC practices the focus had shifted towards a stronger alignment of teaching practices to content standards through an on-going analysis of student learning data. These participants also expressed a desire for additional professional development on how to rigorously focus collaboration in order to maximize the effects on teaching and learning. P9 stated:

> I feel like through this year long process we have all learned a great deal about ourselves, our students, and our school. The discussions we have been able to have during collaboration sessions have fundamentally changed our instructional practices. Seeing the professional growth in my peers and myself just through this first year of implementation has been amazing. We basically started at ground level with what we knew and understood about the PLC practices we were to implement last year. We received training that supported the implementation at the beginning of the year along with the materials we would need then we just started doing it. It was through collaboration with each other that we discovered some of what we were doing was working and some was not. We began to work together to attempt to figure things out

and to improve what we were doing. A lot of this was just trial and error. Had we had more in-depth and more ongoing professional development, we probably would have saved a great deal of time trying out things that didn't work so well.

P 15 explained:

> When instructional practices improve it is inevitable that student learning will also improve. We have seen increases in student achievement through the assessments we have given over the course of this school year as compared to the same data from previous years when the PLC practices were not in place. Regular, structured collaboration opportunities have been the cornerstone of this positive change. Collaboration has been the critical factor involved in making the PLC implementation a success. With all we have learned and accomplished this year, I am hoping that we can continually learn more about the practices we are using. Hearing talk around school about what teachers have tried in their own classrooms and what they have discovered actually changed their teaching has been interesting. I think that it would benefit all of us in our second year of implementing these practices if we could come together as a whole staff and share what we have learned and what we still need to know more about then to have professional development opportunities that focus on closing those knowledge gaps. To think of what we could accomplish with more knowledge and support is really huge.

Other participants continued to express the value of the Collaboration Plan to improving their instructional practices. P2 reported:

> For me the collaboration plan was the cornerstone to this process and led to the biggest change in how I teach my own students. Collaboration opened my eyes to see what else is going on in the school things that are the same and different from what I'm doing, how

things are being done, whether they are the same or different. It gives me ideas of things I can do to make my classroom better than what it already is. It's a feeling of knowing peers, being able to work with them better because you know their ideas, thoughts, and practices.

P4 also expressed that collaboration had directly and indirectly affected her instructional practices:

> It was critical to the implementation of the PLC practices that we collaborated and tweaked things that we felt needed to be modified in order to improve every aspect of what we were doing. Through collaboration we came back to the drawing board several times. Not only did this improve our work, but also have ownership in and a deep knowledge about what we were doing. Collaboration was at the center of the entire process.

Other teachers described the influence that the use of the common formative assessment and the implementation of differentiating instruction had on their teaching. P9 stated:

> Having a good firm grasp on the weaknesses and exactly where those weaknesses lie allows me to better my differentiated instruction. I've been able to look at an individual child, find that child's literacy weaknesses, and focus on that. What I feel would help me to improve what I do even more would be to better understand the use of formative data to guide instruction. As a PLC we have had many discussions about this and things my colleagues have shared with me have helped; however, I would like more formal and research based information that explicitly focuses on what differentiating my instruction should look like.

Additional responses went on to explain that all three PLC practices were linked together and must each be fully implemented in order to see change in instruction and student learning outcomes. P16 stated:

> The common formative assessment gives me a starting point of knowing what each student in my class needs at any given time during the year. With that knowledge I begin planning how to differentiate my instruction to address those needs. Then through collaboration with my colleagues, I am able to trouble shoot and fine tune my instruction even more. That's how things have changed in my classroom and I believe in every classroom in this school, it's more of a fluid, evolving process rather than a one shot instruction directed towards the middle group of kids then moving on.

Research Question 3: Have student learning outcomes changed with the implementation of the PLC practices of common formative assessment, collaborative planning and differentiated instruction?

The BAS was administered at the beginning of the year for the purpose of collecting baseline data that would provide information related to students' reading performance. The baseline data was used to identify student strengths and weaknesses, to develop initial flexible groupings, and to plan differentiated instruction. The BAS was also administered at the end of the year. This data was used to determine if students were meeting end of year standards in reading. Beginning and end of year BAS data were compared to ascertain progress in reading by student, class, grade level, and school-wide. The 2013/2014 school year was the initial school-wide implementation year of the PLC practices.

The criterion for meeting the Kindergarten grade level standard was a scaled score of 3. The mean scores during both the 2012/2013 and 2013/2014 school years increased significantly

from the beginning of the year and end of year administrations of the BAS. During the 2012/2013 school year the beginning of the year means score was 2.57 with a 2.35 SD which is below the grade level criterion for meeting the standard, however, the mean at the end of the year was 5.47 with a 3.11 SD which was well above the mean score of 3. During the 2013/2014 school year the beginning of the year means score was 2.24 with a 1.66 SD which is below the grade level criterion for meeting the standard, however, the mean at the end of the year was 4.99 with a 1.89 SD which was also well above the mean score of 3. The increase in means was slightly greater during the 2013/3014 school year when the Common Formative Assessment, Collaboration, and Differentiated Instruction were first implemented school-wide than in the 2012/2013 school year when there was no implementation. Table 22 provides the mean scores generated by beginning and end of year administrations for Kindergarten during both the 2012/2013 school year and the 2013/2014 school year.

Table 22

BAS Beginning and End of Year Mean Scores for 2012/2013 and 2013/2014 – Kindergarten

	Beginning of Year Administration			End of Year Administration			
	Mean	SD	df	Mean	SD	df	p
SY 2012/2013	2.57	2.35	113	5.47	3.11	113	<.001
SY 2013/2014	2.24	1.66	93	4.99	1.89	96	<.001

The criterion for meeting the grade level standard for First Grade is a score of 9. The means during both the 2012/2013 and 2013/2014 school years increased significantly from the beginning of the year and end of year administrations of the BAS. During the 2012/2013 school

year, the beginning of the year means score was 4.86 with a 3.98 SD which is below the grade level criterion for meeting the standard, however, the mean at the end of the year was 10.57 with a 3.18 SD which was above the mean score for meeting the standard. During the 2013/2014 school year the beginning of the year means score was 4.77 with a 3.50 SD which is below the grade level criterion for meeting the standard; however, the mean at the end of the year was 10.54 with a 3.06 SD which was also well above the mean score for meeting the standard. This data reflected a 6.09 increase in means from BOY to EOY. Table 23 provides the mean scores generated by beginning and end of year administrations for First Grade during both the 2012/2013 school year and the 2013/2014 school year.

Table 23

BAS Beginning and End of Year Mean Scores for 2012/2013 and 2013/2014 – First Grade

	Beginning of Year Administration			End of Year Administration			
	Mean	SD	df	Mean	SD	df	p
SY 2012/2013	4.86	3.98	112	10.57	3.18	102	<.001
SY 2013/2014	4.77	3.50	81	10.54	3.06	104	<.001

In addition to an analysis of group mean scores for Kindergarten and First Grade from beginning and end of year administrations of the BAS during both the 2012/2013 and 2013/2014 school years, data reflecting the percentage of students from each grade that met standard was also considered. Figure 6 provides the percentage of students scoring at or above the grade level standard for Kindergarten, and includes beginning and end of year administrations of the BAS for kindergarten in both the 2012/2013 school year and the 2013/2014 school year.

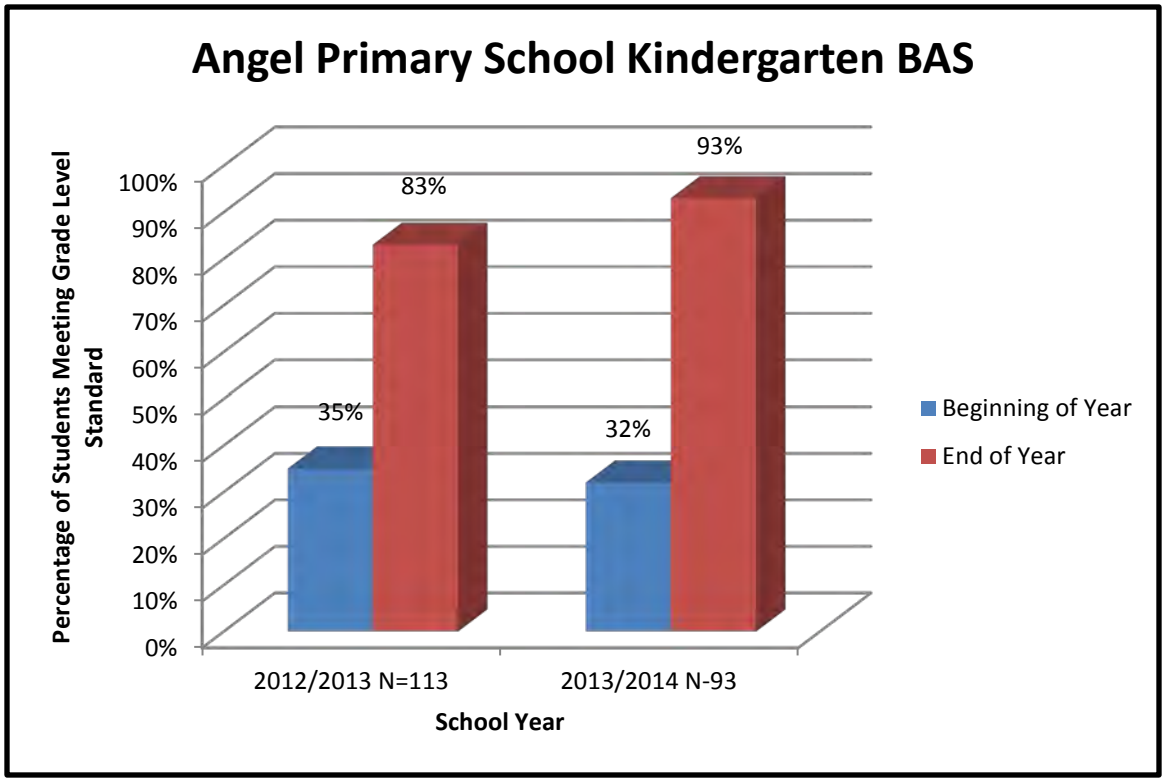


Figure 6. Percentage of Students Meeting the Grade Level Standards in 2012/2013 and 2013/2014 – Kindergarten

Figure 7 provides beginning and end of year administrations of the BAS in both the 2012/2013 school year and the 2013//2014 school year for First Grade. Data indicates that during the 2012/2013 school year the percentage of students meeting the grade level standard increased by 64 percent from the beginning of the year to the end of the year. During the 2013/2014 school year the number of students meeting the grade level standard increased by 73%. During the 2012/2013 school year students below grade level standard was 18%. At the end of the 2013/2014 school year 13% of students did not meet grade level standard. When looking across the two school years, 2012–2013, before implementation and 2013–2014, after

implementation of one year, a 5% increase in the students meeting the grade level standard occurred.

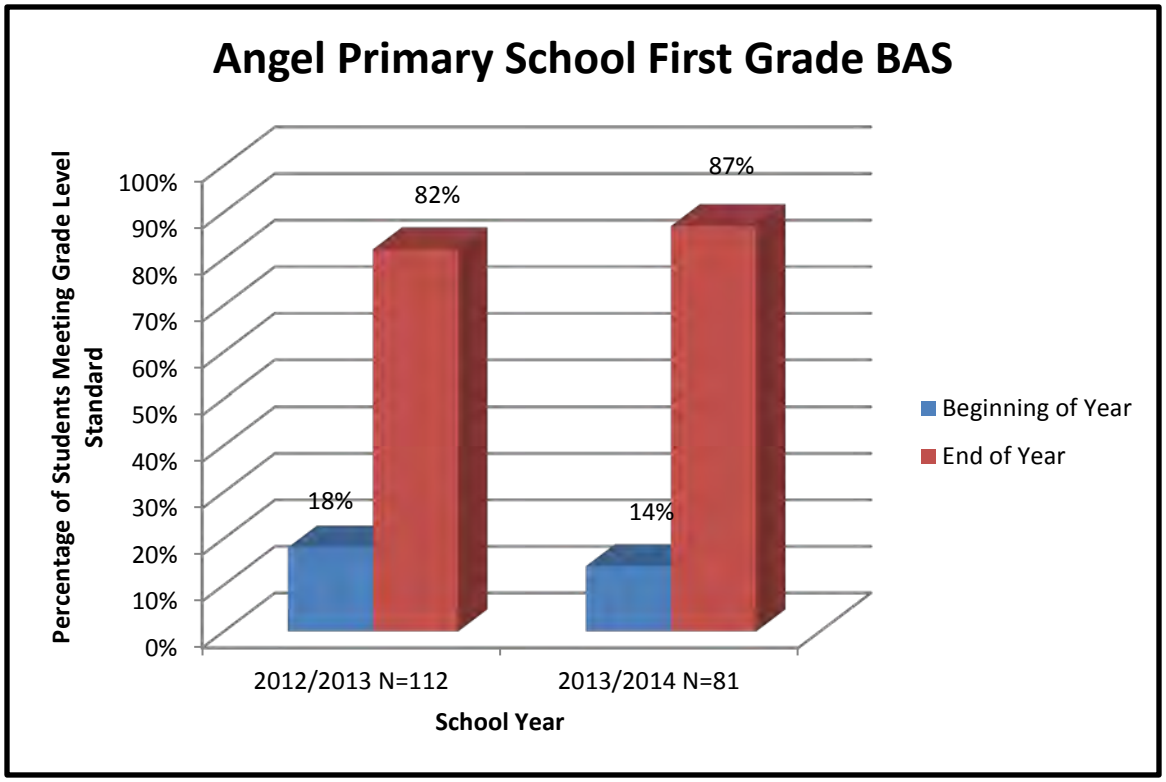


Figure 7. Percentage of Students Meeting the Grade Level Standards in 2012/2013 and 2013/2014 – First Grade

In summary, statistically significant change occurred from the beginning of the year to the end of year administrations of the BAS among both the Kindergarten and First Grade students during the 2012/2013 and 2013/2014 school years.

Conclusion

The findings of the present research study were reported in Chapter 4. The data collected included BOY and EOY scores for the Angel Primary School PLC Survey, the SoCQ Survey and the student BAS. This data was supported by additional data in the form of structured

interviews, agendas and minutes of meetings and other documents related to the implementation of PLC principles.

The analysis of data revealed several patterns and themes. Based on change that occurred from the beginning of the year to the end of the year administrations in each of the six Principles included in the Angel Primary School PLC Survey it is clear that the participants perceive the school-wide implementation of the PLC Practices facilitated some positive changes. However, the analysis of the beginning of year SoCQ data compared to the analysis of the end of year SoCQ data indicated concerns pertaining to the school-wide implementation persist and could serve to stifle or hinder the sustainability of the implementation. The Fountas and Pinnell Benchmark Assessment data suggested factors that took place during the 2013/2014 school year at Angel Primary School did positively affect student learning outcomes. It is difficult to determine if this was due to the school-wide implementation of all three PLC practices, one of the PLC practices alone, or a combination of two specific practices.

Interviews, documents and artifacts did support findings from the quantitative data. The sole obstacle that was mentioned most often in the qualitative data was the issue of time. Participants expressed great concern about the full implementation of the PLC Practices with fidelity due to insufficient time to prepare, administer the Common Formative Assessment, and to collaborate for the purpose of analyzing assessment data and planning differentiated instruction to meet the needs identified in the student learning data.

Chapter Five will discuss the implications of these findings as well as the recommendations for action they suggest. Chapter Five will also include recommendations for further study and the researcher's reflection on the research process.

CHAPTER V. SUMMARY, INTERPRETATIONS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Chapter Five of this mixed methods descriptive case study provides the analysis of data collected and used to determine the effect that the school-wide implementation of three certain Professional Learning Community practices. Those practices were common formative assessment, the collaboration plan and differentiated instruction. The study examined the facilitators and hindrances of implementation change in teacher practices and student learning outcomes during the school-wide implementation year at Angel Primary School. The school-wide implementation of the PLC resulted from a successful year-long pilot of the Common Formative Assessment, the Collaboration Plan, and Differentiated Instruction during the 2012/2013 school year.

The researcher used a PLC Survey to identify facilitators and hindrances, the Stages of Concern Questionnaire to recognize changes in teacher practices, interviews, student learning data generated by the Fountas and Pinnell Benchmark Assessment System (BAS) to determine changes in student learning outcomes, and additional artifacts and documents to describe the findings that emerged through the school-wide implementation process.

This study was conducted in a primary school setting. Angel Primary School is located on Ft. Rucker Army Instillation in Ft. Rucker, AL. The school serves student in Pre-K through 1st grade levels. All students attending Angel Primary School are children of active duty military

personnel who live in Ft. Rucker housing. Angel Primary School is a part of a district that includes schools in Georgia and Alabama. All the schools in this district as well as other districts serving students of active duty military members across the United States and abroad operate under the policies and procedures of an education organization located in Arlington, VA.

Mixed methods descriptive case study design was used for this study due to the fact that this methodology involves the intentional collection of both quantitative and qualitative data and the combination of the strengths of each to answer research questions. The researcher collected qualitative data through the interview process and the use of information gleaned from additional artifacts and documents to include collaboration agendas and meetings as well as staff and grade level agendas and minutes. Quantitative data was collected from the beginning and year administrations of the SoCQ and PLC Survey among participants and student learning data generated by the beginning and year administrations of the Fountas and Pinnell Benchmark Assessment System (BAS). Triangulation of data through mixed methods serves to strengthen and offset any potential weaknesses of using either quantitative or qualitative approach. Quantitative scores on an instrument from many individuals could serve to offset the weaknesses of qualitative documents from few people and that in-depth qualitative observations of a few people by providing detailed information about the context or setting in which individuals provide information when the quantitative data cannot(Creswell, 2002; Creswell & Clark, 2007).

The framework of the case study was based on the five attributes of PLCs identified through the work of Hord (1997, 2004): 1) supportive and shared leadership, 2) shared values and vision, 3) collective learning and the application of that learning, 4) shared practice, and 5) supportive conditions.

Eighteen certified teachers were represented in this case study. The participants were selected because of their involvement in the school-wide implementation of the three PLC practices; common formative assessment, collaboration, and differentiated instruction. In addition each teacher participated in all professional development related to the implementation of the PLC practices and was an active member of their grade level PLC through the entire school year.

Research Questions

The questions that guided this study were:

1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?

Table 24 indicates which data sources were used to address each individual research question.

Table 24

Data Sources used to Address Research Questions

Research Question	Data Collection Instruments
1. What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?	Angel Primary School PLC Survey and Interviews, Documents and Artifacts
2. As perceived by the teachers, to what extent have instructional practices changed as a result of the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?	SoCQ and Interviews, Documents and Artifacts
3. Have student learning outcomes changed with the implementation of the PLC practices of Common Formative Assessment, Collaboration Planning, and Differentiated Instruction?	BAS

Implications of Key Findings

Research Question 1: What factors facilitated and/or hindered PLC implementation of Common Formative Assessment, Collaboration Plan, and Differentiated Instruction?

The researcher used the Angel Primary School PLC Survey to determine any changes to the culture of Angel Primary during the implementation year. The analysis of data collected from the survey suggests that the school culture changed in a positive direction. In all six categories (Shared and Supportive Leadership, Share Values and Vision, Collective Learning and Application, Shared Personal Practice, Supportive Conditions-Relationships, and Supportive Conditions-Structures) the teachers reported a positive and significant change. Research

Question One revealed that responses from all six sections of the survey are relevant to the question because the PLC Survey assessed participant perceptions about the school leadership, staff and stakeholders based on the five principles of PLCs identified by Hord (1997, 2014). This question focused on overall implementation of the PLCs as well as the current state and sustainability of the practices being implemented.

Means for each of the six sections of the survey administered at the beginning of the year ranged from 3.25 with a .50 SD in Shared and Supportive Leadership to 3.45 with a .49 SD in Shared Vision and Values. End of year means on the PLC Survey ranged from 3.53 with a .44 SD in Supportive Conditions-Structures to 3.63 with a .42 SD in Shared and Supportive as well as a 3.63 with a .43 SD in Shared Values and Vision. The high level of these End of Year means indicate that the overall nature and effects of the school-wide implementation of PLC practices was positive and strong.

Four of the six principles addressed by the Angel Primary School PLC Survey did experience statistically significant change from the beginning to the end of the 2013/2014 school year. Significant change occurred in the principles Shared and Supportive Leadership, Shared Personal Practice, Supportive Conditions-Relationships, and Supportive Conditions-Structures. Although change in the principles Shared Values and Vision and Collective Learning and Application was not significant, both principles did improve from the beginning of the year to the end of the year.

The analysis of data revealed a number of factors that facilitated the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction. Evidence of facilitative factors was identified in relation to each of the four principles addressed by the Angel Primary School PLC Survey that experience significant change.

Facilitating Factors

Shared and supportive leadership. Survey data indicated that a strong overall facilitator was the principle Shared and Supportive Leadership. It is interesting to the researcher that the principle Shared and Supportive Leadership had the lowest mean score at the beginning of the year then received the highest mean score at the end of the year. This suggests that either school leadership became more actively involved in the implementation of the PLC practices as the implementation year progressed or the participants developed a greater understanding of the influence of school leadership on the success of the implementation. Significant change occurred in Shared and Supportive Leadership. Leadership became more collaborative and democratic. Additionally, faculty members used multiple sources of data to make decisions about teaching and learning, the faculty gained confidence in collaborating with peers and they were encouraged by leadership to initiate change. Shared and supportive leadership was very important to the implementation of the PLC initiative of common formative assessment, the collaboration plan and differentiated instruction and should be seen as a facilitator of the change Interview data provided evidence to support increased leadership support and involvement. P12 stated:

> The high expectations of the school leadership motivated me to give 100% to the implementation of the common formative assessment, collaboration plan, and differentiated instruction plan with fidelity. I know I speak for others in saying that the development of an assessment calendar which held us to specific windows of time for the administration of the common formative assessment at the beginning, middle, and end of the school year and the creation of the assessment and differentiated instruction kits that contained everything needed for implementation were critical to successful

implementation. School leadership and the work of the original PLC were responsible for accomplishing that.

The relevance and importance of positive change as indicated by increases in mean scores in the area of Shared and Supportive Leadership is supported by research. Addressing and assuring student learning and purposefully broadening the leadership base in school environments is a critically important outcome of successful implementation of PLCs in schools (Hipp, Huffman, Pankake, & Olivier, 2008). Fullan (2002) identified the practice of building leadership base in schools as a critical influence on community improvement, teacher learning, and improved student learning outcomes. Specific facilitators within the principle Shared and Supportive Leadership included high expectations from school leadership, strong leadership support through the implementation process, teacher autonomy and freedom to make professional decisions, teacher empowerment, encouraged risk taking, and leadership focus on collaboration.

Shared personal practice. The greatest increase in mean scores between the beginning and end of year administration of the Angel Primary School PLC survey occurred in Statement 7 in the *Shared Personal Practice* principle: Staff members regularly share student work to guide overall school improvement. This data indicated that collaboration opportunities focused on the sharing and analysis of student work by the teachers was a facilitative factor to the implementation process.

The identification of collaboration through Shared Personal Practices as a facilitative factor in the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction is supported by interview data. In response to a question pertaining to the focus of collaboration P13 reported:

> We knew our priorities had to be focused on the analysis of student work and assessment results and on the planning of differentiated instruction to address needs seen in what was produced by our students. We were also able to have in-depth discussions about what was working with our instruction and what was not.

P8 added:

> We come together as a team to take a very close look at student work in order to analyze how they perform on an assessment so we can then adjust our instruction. We are able to see the things we need to be teaching to address their weaknesses.

Improvement in the principle Shared Personal Practice served as a facilitator to this implementation. Positive change in this principle was significant and supported by previous research. Goddard, Goddard, and Tschannen-Moran (2007) discussed that the most important outcome of teacher collaboration was improvement in teacher instruction. Chokshi and Fernandez (2005) and Vescio, Ross, and Adams (2008) maintained that there is now an urgent need for America's teachers to find ways to collectively build their personal knowledge, widely share this knowledge, and transform personal knowledge into cohesive professional knowledge among colleagues for the purpose of meeting the needs of all students. PLCs as a vehicle for change can make this possible (Chokshi & Fernandez, 2005; Vescio et al., 2008a).

Overall facilitating factors related to the principle Shared Personal Practice included opportunities for collaboration among PLC members to share strategies to improve instruction, to examine student work, to apply their own learning and to share results of their own instructional practices. This leads the researcher to believe that through the implementation process teachers began to see the value of collaboration and began to take advantage of

collaboration opportunities to share their own practices and to learn from the practices of their colleagues.

Supportive conditions. Supportive conditions, a Principle of PLCs identified by Hord (1997), determines when, where, and how school staffs collaborate for the purpose of making decisions, solving problems, and working creatively. This attribute has been defined as the most critical factor for school improvement because it provides the structures that sustains and supports the school vision and the functions of the learning community.

Supportive Conditions was treated as two principles on the Angel Primary School PLC Survey, Supportive Conditions-Relationships and Supportive Conditions-Structures. Evidence of Supportive Conditions-Relationships as a facilitator to the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction was identified through teacher responses to this principle within the Angel Primary School PLC Survey and in interview responses. Teachers indicated that they felt more positively about the presence of caring relationships, a culture of trust, and a unified relationship between all stakeholders from the beginning of the year to the end of the year. Increases in means occurred in all five statements within this principle and change related to Supportive Conditions-Relationship was significant. Research supports school culture and relationships as critical factors in the successful implementation of PLCs in schools. "The single most important factor for successful school restructuring and the first order of business for those interested in increasing the capacity of their schools is building a collaborative internal environment that fosters cooperative problem-solving and conflict resolution" (Eastwood & Louis, 1992, p. 215).

Overall facilitators within Supportive Conditions-Relationships included an overall supportive school culture, adequate resource personnel to support the implementation, effective

communication systems, opportunities for daily collaboration due to teachers working in pods with other teachers, and professional development opportunities. The researcher believes that this change may be due to an increased level of confidence and comfort in collaboration as seen in the principle Shared Personal Practice and in the increased teacher empowerment and the encouragement to take risks as seen in the principle Shared and Supportive Leadership.

Facilitators within Supportive Conditions-Structures included the availability and ease of access to more than adequate technology needed for implementation, the availability of data to all teachers, and complete, organized sets of materials needed to administer the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction available to all teachers. Teachers indicated that the building was well maintained and that the physical layout of the building promoted collaboration. Responses to the Angel Primary School PLC also suggested that the more than sufficient availability of technology supported easy access to data and other information necessary to implementation of the PLC practices.

Hindrances

Hindrances to the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction that were identified through the analysis of the Angel Primary School PLC Survey data as well as interview response data were related to time. Data indicated that teachers believed there was a need for more time to be included in the daily and weekly schedule for formal collaboration focused on examining student work, analyzing data, and planning differentiated instruction to address student needs identified through the data analysis. Participants indicated that time provided to facilitate collaboration may be insufficient. Teachers' survey and interview responses indicated that more time should be set aside for formal collaboration and that the time requirement for the administration of the Common Formative Assessment may outweigh the value of the student learning data generated by the assessment.

Interview data supported teachers' concern about the time needed to fully implement the PLC practices. P15 reported:

> It takes a long time to give this assessment. I worry that giving it three times each year cuts into instruction time. I think it's a plus to use the beginning and end of year data in order to see change over time, but I don't know if it gives us any more info by giving it more times. Some of that info you can gather from work in small groups.

The Angel Primary School PLC survey data in this area participant suggests that the time consuming nature of the administration of the Common Formative Assessment could lead to frustration among participants and could ultimately result in a breakdown in full implementation of the practices. Identification of these concerns could be used to modify the assessment or the number of times each year the assessment is administered to create a more user friendly tool. Research conducted by the NCATF stated that dedicated and formally established time and space for collaboration are necessary for successful and sustainable PLCs (Carroll et al., 2010).

In summary, data collected through the administration of the Angel Primary School PLC Survey pointed to practices that took place throughout the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction which served as facilitators to the implementation as well as practices or factors that may have hindered the implementation. Facilitators and hindrances related to the principles addressed by the Angel Primary School PLC Survey were identified. Survey data indicated that a strong overall facilitator was the principle Shared and Supportive Leadership. Specific facilitators within the principle Shared and Supportive Leadership included; high expectations from school leadership, strong leadership support through the implementation process, teacher autonomy and freedom to make professional decisions, teacher empowerment, encouraged risk taking, and leadership focus

on collaboration. The principle Shared Personal Practices focused on the effective use of collaboration to improve teacher instruction. Facilitators related to the principle Shared Personal Practice included opportunities for collaboration among PLC members to share strategies to improve instruction, to examine student work, to apply their own learning and to share results of their own instructional practices.

Supportive Conditions was treated as two principles on the Angel Primary School PLC Survey: Supportive Conditions-Relationships and Supportive Conditions-Structures. Facilitators within Supportive Conditions-Relationships included: an overall supportive school culture, adequate resource personnel to support the implementation, effective communication systems, opportunities for daily collaboration due to teachers working in pods with other teachers, and professional development opportunities. Facilitators within Supportive Conditions-Structures included the availability and ease of access to more than adequate technology needed for implementation, the availability of data to all teachers, and complete, organized sets of materials needed to administer the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction available to all teachers.

The most predominate hindrances to the implementation process were related to the amount of time necessary to implement all the PLC practices with fidelity. Teachers indicated that there was need for more time to be included in the daily and weekly schedule for formal collaboration focused on examining student work, analyzing data, and planning differentiated instruction to address student needs identified through the data analysis. Teachers' surveys and interview responses also indicated that the time requirement for the administration of the Common Formative Assessment may outweigh the value of the student learning data generated by the assessment.

Research Question 2: If positive change in teaching practices has occurred, are there indications of improved student learning outcomes?

The researcher used data generated from the pre- and post- administrations of the SoCQ at Angel Primary School as the primary data source in responding to Research Question Two. Research indicates that the concerns of teachers allows for the identification of their acceptance and full application of a new implementation to their own instructional practice (Vaughan, 2002). Research also supports the importance of teachers' level of concern and how they feel in general about the implementation of a new innovation. Teachers' concerns on educational changes can be described as the feelings, thoughts and reactions related to the new innovations they are expected to implement with fidelity in their work environment. The level and type of teachers' concerns critically influence the implementation of educational change due to the fact that their perceptions and actions powerfully affect the success of the innovations (Puteh, Salam, & Omar, 2012).

The SoCQ addresses seven stages that measure teachers' level of concern about a new innovation; Stage 0-Awareness, Stage 1-Informational, Stage 2-Personal, Stage 3-Management, Stage 4-Consequence, Stage 5-Collaboration, and Stage 6-Refocusing. As concerns at stages 0-Awareness through 3-Management are reduced, teachers begin to express higher concerns at stages 4-Consequence through 6-Refocusing.

Although change did occur from the pre-administration to the post-administration at each of the seven stages addressed by the SoCQ, none were significant. The SoCQ results of both the pre- and post-test indicated participants still had a great need for additional information pertaining to PLC implementation of Common Formative Assessment, Collaboration Plan and Differentiated Instruction. Results of the SoCQ indicated teachers needed more information

related to how the implementation will affect them personal and professionally. This is evidenced by very high mean scores at Stages 0-Awareness, 1-Informational, and 2-Personal on both the pre- and post- test. The high level as well as the increase in the mean at Stage 0, Unconcerned, from the beginning of the year to the end of the year was of great concern to the researcher. This increase suggests that there are a number of additional elements in the school environment that may be competing for the participants' time and attention (Hall & Hord, 2006). This would further explain the participants' time concerns which was identified as a hindrance to the implementation and discussed in response to Research Question 1.

The high mean at Stage 1, Informational, indicates that there is a great desire to acquire additional knowledge about the PLC practices. It is important to note that the high mean at Stage 1 isn't necessarily reflective of the level of knowledge the group of participant already has pertaining to the PLC practices, but rather simply there is a need for additional information. The data suggests that in spite of professional development that was provided to equip participants for successful implementation of the PLC practices there are still unanswered questions and unaddressed concerns among the group.

The third stage with a relatively high mean score was Stage 2, Personal. Higher means at this stage suggest that the participants are fairly concerned about how the implementation of the PLC practices could affect them personally in terms of workload, their status in the organization and their abilities to meet the demands of the implementation process. The researcher is convinced that a correlation exists between the high means in both Stages 1 and 2 and believes that insufficient information about the PLC practices indicted by the mean of Stage 1 is cause for the personal concern identified through the mean in Stage 2. These data are of concern to the researcher and are supported by previous research: a lack of appreciation, knowledge and skills

as well as positive attitudes towards the changes could create gaps between planned and enacted changes (Puteh et al., 2012).

The level of concern decreased in intensity at Stage 3-Management indicating that teachers were not overly concerned about logistics, time, and management related to the implementation process. Stage 4-Consequence had the lowest mean scores at both the pre- and post- administrations of the SoCQ. Low scores at Stage 4 suggest that the teacher has minimal concerns about how the implementation of the Common Formative Assessment, Collaboration Plan, and Differentiated Instruction will affect their students. The decrease from the beginning of the year to the end of the year in mean scores in statements at Stage 5 related to collaboration indicated that participants were not overly concerned about their focus on coordination and cooperation with others regarding implementation. Lower levels of concern at Stages 3-5 is most probably due to the teachers feeling as though they don't know enough about the implementation to be equipped to collaborate with others. This is of concern to the researcher. Research supports the relevance of teachers learning together through collaboration to positive change in instruction. Louis and Kruse (1995) stated that this type of collective creativity evolves through reflective dialogue and formal and informal conversations about teaching practices and student learning. The success and sustainability of a PLC that learns collectively is influenced by the degree of school staff commitment to utilizing the talents and strengths of all members to push for a high quality of intellectual learning for both themselves and the students they teach (Newman & Wehlage, 1995). The decrease from the beginning of the year to the end of the year in the mean scores statements at Stage 6 related indicates that participants are not ready to find new ways to use the PLC practices in their classrooms.

Interview responses supported the teachers' need for additional knowledge and more intense and ongoing professional development in order to fully implement the Common Formative Assessment, Collaboration Plan and Differentiated Instruction as identified through the SoCQ data.

In response to a question pertaining to whether or not sufficient training was provided to equip participants for the implementation of the PLC practices, P13 responded:

> I think schools take for granted that even though you are new you have taught for many years and expect you to already know what's being done and what's being implemented. . I sort of had to dig some but I have two people that I work with who make sure I know what's going on.
>
> Training on practices for new teachers is something that many schools don't do a great job with. Look at me I come in having taught for 25 years but when you come to a new system there still are new things and even though I've come from another DoDEA school that uses the same curriculum, I think schools as whole don't do the best job with new teacher training. The training I did get helped things to go more smoothly. Again, the organization and the help of the two peers I work with made the implementation go very smoothly.

Overall responses on the SoCQ indicate that teachers felt they needed additional knowledge about the PLC practices in order to successfully implement them, and that they were increasingly concerned about how the implementation could affect them personally. The researcher believes that this SoCQ data points to the fact that the teachers are possibly still following the lead of the initial PLC in the implementation of the three PLC practices and are not yet ready to take on leadership roles in the implementation process. The initial PLC received 40

hours of training to include the study of research. Initial PLC members were also given the opportunity to develop the common formative assessment and differentiated instruction plan as well as pilot the assessment and differentiated instruction in their own classrooms during a year-long pilot. The year-long pilot also allowed the initial PLC members an opportunity for frequent collaboration for the purpose of examining student work and analyzing common formative assessment data. During the pilot the PLC members identified strengths and weaknesses in the common formative assessment and differentiated instruction plan and made research based modifications. The researcher believes that the staff involved in the first year of school-wide implementation of the PLC practices is still relying on the leadership and knowledge of the initial PLC team and does not yet feel confident enough to take on leadership or mentorship roles. The researcher is convinced that in order to ensure sustainability of the PLC implementation at Angel Primary School this area of concern must be addressed.

Research Question 3: If positive change in teaching practices has occurred, are there indications of improved student learning outcomes?

Data generated by the beginning and end of year administrations of the Fountas and Pinnell Benchmark Assessment System (BAS) over the course of two years along with responses collected through the interview process predominately used to answer Research Question 3. Kindergarten student learning data from the beginning of the year administration of the BAS was compared with data from the end of the year administration during the both the 2012/2013 and 2013/2014 school years. Significant change did occur from the beginning of the year to the end of the year for both school years. First grade student learning data from the beginning of the year administration of the BAS was also compared with data from the end of the year administration during the both the 2012/2013 and 2013/2014 school years. Significant change

did occur from the beginning of the year to the end of the year for both school years at this grade level as well.

There were interview responses supporting the idea that teaching did change. This may have resulted in the improvement of student learning outcomes as seen in the increase in the percentage of students meeting grade level standard on the BAS across the two school years. P10 shared:

> 'I don't know if a certain assessment instrument is the reason students are learning more, I think we as teachers work to improve our instruction all the time.' A second participant commented, 'The students are more aware of the assessments being used, rubrics being used which gives them a better understanding of what it is we want from them which allows them to focus their work and improve their learning.'

P9 reported:

> We have been able to measure and see in those very specific tenants of reading comprehension the growth the children have had for instance, we are better able to teach story elements because we focus on that skill more than we did in the past. We teach them about each of the areas an terms they haven't been familiar with in the past. Again by placing rigorous focus on these areas we are making them much more aware of their weaknesses and strengths as well as the areas of reading comprehension and what they need to be able to do to better understand what they are reading.

Benchmark Assessment System (BAS) data confirmed that student learning outcomes did improve through the first year of school-wide implementation of the PLC practices. Significant positive change in student learning outcomes as measured by the BAS did occur from the beginning of the year to the end of the year of both the 2012/2013 and 2013/2014 school years at

Kindergarten and First Grade levels. However, no significant change was evident when comparing BAS data for both grade levels from the end of the 2012/2013 and 2013/2014 school years.

Gallimore, Ermeling, Saunders, and Goldenberg (2009) studied the effects that the implementation of an inquiry-based protocol had on teacher perceptions, instructional practice, and student achievement. The study verified that participation in Professional Learning Communities had a positive influence on teacher attitudes and student achievement. Although, it cannot be specifically determined which of the PLC practices implemented at Angel Primary School may be responsible for positive change in student learning outcomes, the data is evidence that one practice or a combination of more than one practice did positively influence student learning.

Guiding Framework

This study was guided and built on the Hord (1997, 2004) framework containing Five Principles of PLCs. The principles in the framework were: 1) Shared and Supportive Leadership, 2) Shared Vision and Values, 3) Collective Learning and the Application of that Learning, 4) Shared Practice, and 5) Supportive Conditions for the Maintenance of the Learning Community. At the beginning of the study the researcher compared the Five Principles of PLCs identified by Hord (1997, 2004) to the three PLC practices being implemented at Angel Primary School in order to identify any possible relationships between the principles and practices. Figure 3 shows relationships that existed between the Hord (1997, 2004) PLC principles and the three PLC practices implemented at Angels Primary School during the 2013/2014 school year. As well, Figure 3 provides evidence that each of the Hord principles was linked in some way to collaboration that was taking place at Angel Primary School.

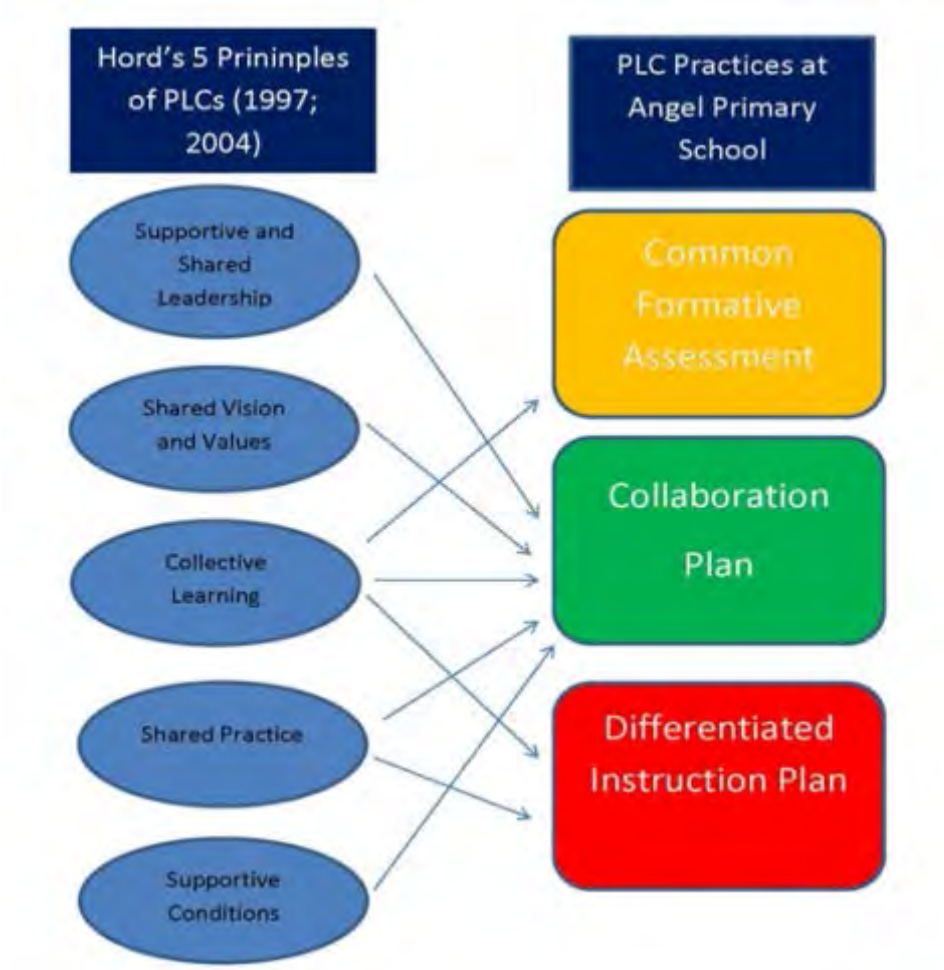


Figure 3. Connections between Hord's Five Principles of Professional Learning Communities and the Professional Learning Community Practices Implemented at Angel Primary School

Throughout the data collection and analysis process in this study collaboration continually emerged as a critical component to the school-wide implementation of the PLC and was perceived by the participants as having more relevance to the success of the implementation than the other two practices being utilized. Analysis of PLC survey data revealed that the greatest gain in mean score in the entire survey from the beginning and end of year administrations occurred in Statement 7 of the Shared Personal Practice principle; Staff members

regularly share student work to guide overall school improvement. The Shared Personal Practice principle of the PLC survey had the second highest mean score next to the Shared and Supportive Leadership principle. In addition to evidence generated by the PLC survey data related to the importance of collaboration to the PLC implementation process, the positive influence of collaboration on instruction and student learning was addressed 37 times in the interviews and additional documents and artifacts. This deepened knowledge pertaining to the importance of collaboration caused the researcher to make modifications to the original conceptual framework used during the implementation process by the staff and leadership at Angel Primary School.

Conceptual Framework

The original framework utilized by the staff and leadership at Angel Primary School was reflective of the connection of each of the three PLC practices that were implemented to each other, how the practices were utilized in a cyclic process throughout the implementation year, and the relationship of the three PLC practices to improved teaching and student learning outcomes. Figure 2 provides a visual of the original conceptual framework.

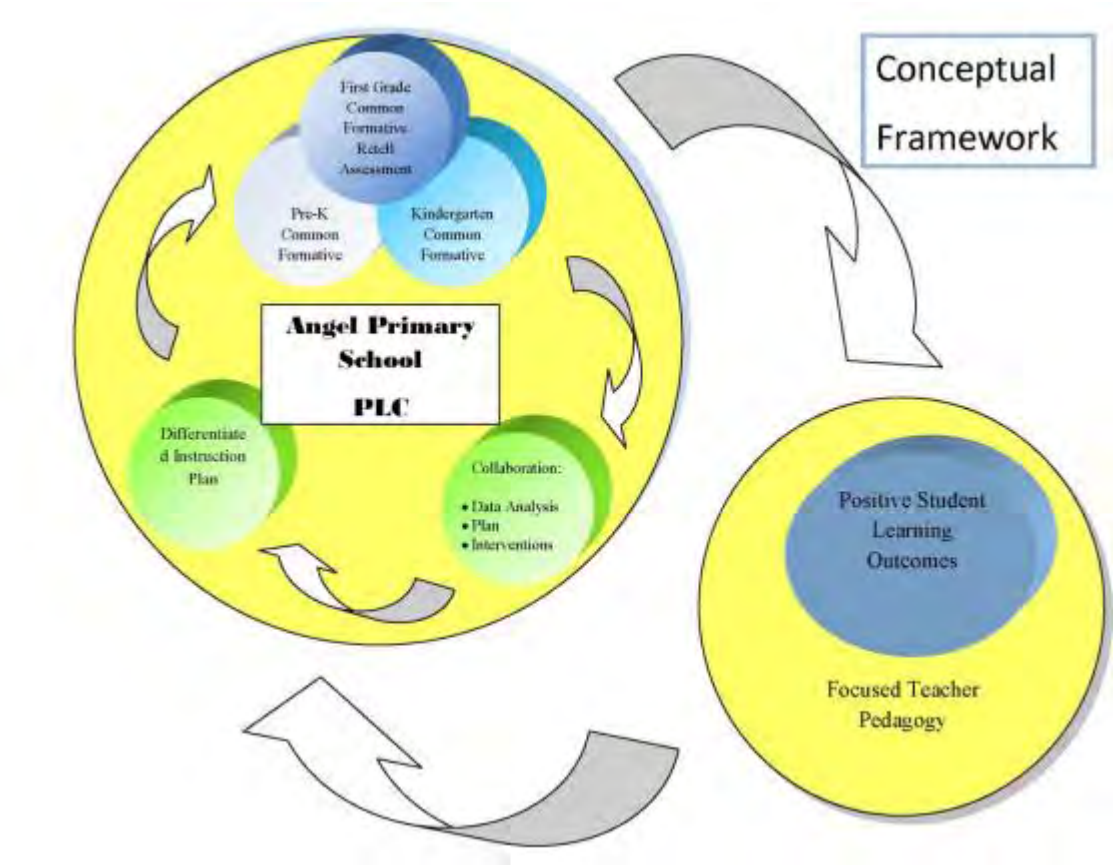


Figure 2. Conceptual Framework for the Implementation of the Three Professional Learning Community Practices at Angel Primary School

The modified conceptual framework shows collaboration as the critical component and foundation supporting the PLC practices of Common Formative Assessment and Differentiated Instruction. Collaboration is continual and ongoing while the administration of the Common Formative Assessment and the application of Differentiated Instruction in classrooms take place in a cyclic format with one leading to the other repeatedly throughout the school year. Figure 8 provides a visual of the modified conceptual framework.

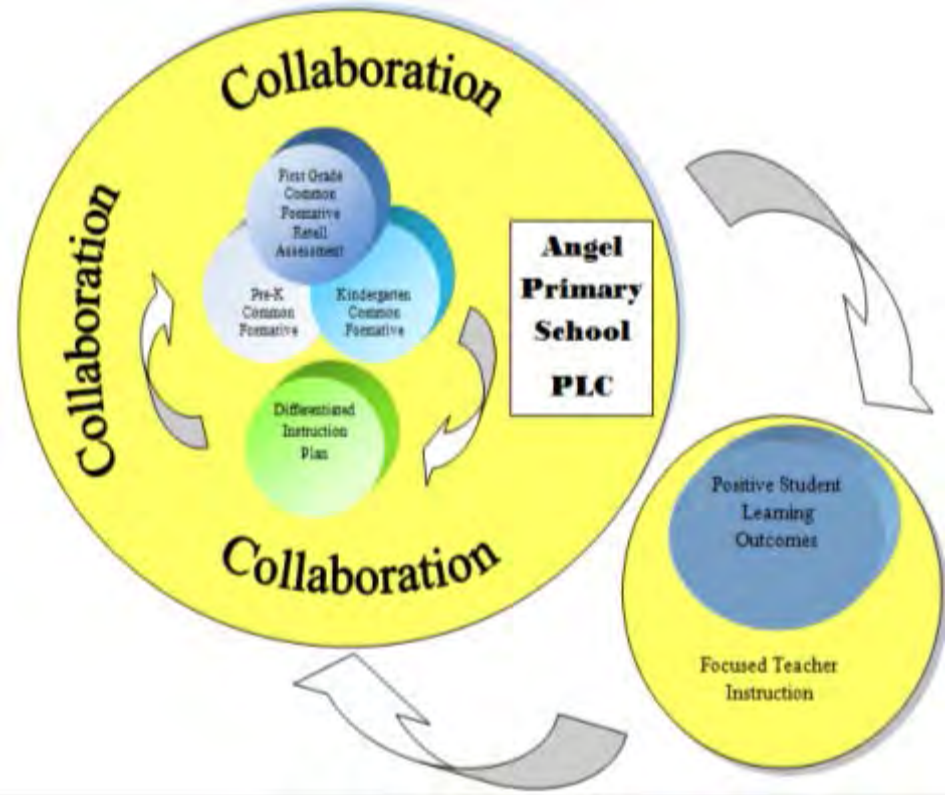


Figure 8. Modified Conceptual Framework for the Implementation of the Three Professional Learning Community Practices at Angel Primary School

Implications for Action

Results suggested that if the PLC practices of Common Formative Assessment, Collaboration, and Differentiated Instruction are applied consistently, student achievement will increase regardless of the staff's personal feelings and concerns about the model.

Findings from this study will be shared with teachers, administrators, and district leaders. One important implication for action is to apply what was learned about factors that hindered the implementation of the PLC practices and to identify and implement solutions to those problems. A second implication for action is to provide pore ongoing professional development opportunities for the purpose of deepening the understanding of the PLC practices and to better

equip staff to successfully implement the practices in their own classrooms and across their grade level PLCs. This is not only critical for current staff members who desire to increase their knowledge of PLC practices, but also for staff members who are either coming in new to the profession or who are new to the school and district. A final implication for action is to share the implementation of the PLC practices with other schools across the district that are not currently utilizing the practices to improve teaching and student learning outcomes.

Recommendations for Future Research

This study provided the researcher with an opportunity to explore the implementation of three PLC practices; Common Formative Assessment, Collaboration, and Differentiated Instruction, in one primary school and to examine the relationship between the implementation of the practices with improved teaching and student learning outcomes. While all data were found to be valid and reliable and did provide insight related to the success of the school-wide implementation of the practices, further research is recommended. The researcher provides the following recommendations for future research:

1. Replicate this study in a school other than a primary school. Evaluation of the implementation of the PLC practices in schools containing grade levels above first grade could result in varied teacher perceptions and concerns related to the three practices as well as identify additional factors facilitating and/or hindering the implementation process.
2. Replicate this study using the same methodology with participants from more than one school. This replication would allow for comparison of outcomes.

3. Replicate this study using the same methodology but extend the study to analyze the effects of the PLC practices on student learning outcomes in regards to ethnicity and gender.

Concluding Remarks

Through this study the researcher intended to determine the degree to which teacher practices have changed as a result of the implementation of PLC practices and if the practices have improved student achievement. The researcher sought to determine identify which elements utilized by the PLC during the pilot were related to improved teaching and learning, how the PLC elements were implemented school-wide, and to investigate how teachers working within a Professional Learning Community (PLC) utilize the components and structure of the PLC to improve their instructional practices and ultimately increase student achievement.

The researcher believes that student achievement should be the highest priority of teachers and school leadership and that when teachers look critically at what they are doing to improve student learning outcomes they are able to make changes to their own teaching in order to increase the positive effects they have on their students. The researcher also believes that when teachers learn to work collaboratively and have frequent opportunities to collaborate for the purpose of analyzing student learning data and planning instruction to meet student needs both teachers and students make meaningful progress in their educational journeys.

This study identified relationships between the three PLC practices implemented at Angel Primary School and the PLC Principles identified through in-depth studies conducted by Hord (1997, 2004). The study confirmed the notion that PLCs may hold the potential to promote professional growth for teachers while concurrently improving student learning outcomes.

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Appendix 1

Auburn University Institutional Review Board Approval

AUBURN UNIVERSITY INSTITUTIONAL REVIEW BOARD for RESEARCH INVOLVING HUMAN SUBJECTS

RESEARCH PROTOCOL REVIEW FORM

For Information or help contact **THE OFFICE OF RESEARCH COMPLIANCE**, 115 Ramsay Hall, Auburn University
Phone: 334-844-5966 **e-mail:** hsubjec@auburn.edu **Web Address:** http://www.auburn.edu/research/vpr/ohs/

Revised 03.26.11 – DO NOT STAPLE, CLIP TOGETHER ONLY. Save a Copy

1. **PROPOSED START DATE of STUDY:** October 1, 2013

PROPOSED REVIEW CATEGORY (Check one): FULL BOARD EXPEDITED ✓ EXEMPT

2. **PROJECT TITLE:** An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration

3. Lynn E. Irwin	Educator		334-494-2280	lei0001@auburn.edu
PRINCIPAL INVESTIGATOR	TITLE	DEPT	PHONE	AU E-MAIL
3396 County Road 157 Enterprise, AL 36330		770-2687483		blirwin84@aol.com
MAILING ADDRESS		FAX		ALTERNATE E-MAIL

4. **SOURCE OF FUNDING SUPPORT:** ✓ Not Applicable Internal External Agency:_____ Pending Received

5. **LIST ANY CONTRACTORS, SUB-CONTRACTORS, OTHER ENTITIES OR IRBs ASSOCIATED WITH THIS PROJECT:**

6. **GENERAL RESEARCH PROJECT CHARACTERISTICS**

6A. Mandatory CITI Training

Names of key personnel who have completed CITI:
Lynn E. Irwin
Ellen Reames

CITI group completed for this study:
✓ Social/Behavioral Biomedical

PLEASE ATTACH TO HARD COPY *ALL* CITI CERTIFICATES FOR *EACH* KEY PERSONNEL

6B. Research Methodology

Please check all descriptors that best apply to the research methodology.

Data Source(s): ✓ New Data ✓ Existing Data

Will recorded data directly or indirectly identify participants? Yes ✓ No

Data collection will involve the use of:
- Educational Tests (cognitive diagnostic, aptitude, etc.)
- ✓ Interview / Observation
- Physical / Physiological Measures or Specimens (see Sect
- ✓ Surveys / Questionnaires
- ✓ Internet / Electronic
- ✓ Audio / Video / Photos
- Private records or files

The Auburn University Institutional Review Board has approved this document for use from 11/3/13 to 11/2/14 Protocol # 13-339 EP 1311

6C. Participant Information

Please check all descriptors that apply to the participant population.

✓ Males ✓ Females AU students

Vulnerable Populations

Pregnant Women/Fetuses Prisoners

Children and/or Adolescents (under age 19 in AL)

Persons with:

Economic Disadvantages Physical Disabilities

Educational Disadvantages Intellectual Disabilities

Do you plan to compensate your participants? Yes ✓ No

6D. Risks to Participants

Please identify all risks that participants might encounter in this research.

- ✓ Breach of Confidentiality*
- Deception
- Psychological
- None
- Coercion
- Physical
- Social
- Other:

*Note that if the investigator is using or accessing confidential or identifiable data, breach of confidentiality is always a risk.

Do you need IBC Approval for this study? No Yes - BUA #_____ **Expiration date** _____

FOR OHSR OFFICE USE ONLY

DATE RECEIVED IN OHSR: 10/1/13 by BK
DATE OF IRB REVIEW: 11/3/13 by CC
DATE OF IRB APPROVAL: _____ by _____
COMMENTS:

PROTOCOL # 13-339 EP 1311
APPROVAL CATEGORY: 45 CFR 46.110(5,6,7)
INTERVAL FOR CONTINUING REVIEW: 1 year

7. PROJECT ASSURANCES

PROJECT TITLE: An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration

A. PRINCIPAL INVESTIGATOR'S ASSSURANCES

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the Auburn University IRB.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with Auburn University policies regarding the collection and analysis of the research data.
4. I agree to comply with all Auburn policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:
   a. Conducting the project by qualified personnel according to the approved protocol
   b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Human Subjects Research
   c. Obtaining the legally effective informed consent from each participant or their legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form
   d. Promptly reporting significant adverse events and/or effects to the Office of Human Subjects Research in writing within 5 working days of the occurrence.
5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OHSR, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the Auburn University IRB.
7. I will prepare and submit a renewal request and supply all supporting documents to the Office of Human Subjects Research before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the Auburn University IRB.
8. I will prepare and submit a final report upon completion of this research project.

My signature indicates that I have read, understand and agree to conduct this research project in accordance with the assurances listed above.

Lynn E. Irwin	Lynn E. Irwin	9-20-13
Printed name of Principal Investigator	**Principal Investigator's Signature** (SIGN IN BLUE INK ONLY)	**Date**

B. FACULTY ADVISOR SPONSOR'S ASSURANCES

1. By my signature as faculty advisor/sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OHSR in writing within 5 working days of the occurrence.
6. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OHSR by letter of such arrangements. If the investigator is unable to fulfill requirements for submission of renewals, modifications or the final report, I will assume that responsibility.
7. I have read the protocol submitted for this project for content, clarity, and methodology

Ellen H. Reames	Ellen H. Reames	9/27/13
Printed name of Faculty Advisor / Sponsor	**Signature (SIGN IN BLUE INK ONLY)**	**Date**

C. DEPARTMENT HEAD'S ASSSURANCE

By my signature as department head, I certify that I will cooperate with the administration in the application and enforcement of all Auburn University policies and procedures, as well as all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants by researchers in my department.

Sheridan Dowler	Sheridan Dowler	9/27/13
Printed name of Department Head	**Signature (SIGN IN BLUE INK ONLY)**	**Date**

8. **PROJECT OVERVIEW: Prepare an abstract that includes:**
(400 word maximum, in language understandable to someone who is not familiar with your area of study):

I.) A summary of relevant research findings leading to this research proposal:
(Cite sources; include a "Reference List" as Appendix A.)
II.) A brief description of the methodology,
III.) Expected and/or possible outcomes, and,
IV.) A statement regarding the potential significance of this research project.

During the 2012-2013 school year, Ft. Rucker Primary School(Pre-k - 1st grade) piloted a Professional Learning Team (PLC) change initiative. This change project focused on bringing about necessary modifications in assessment and instruction in order encourage improvement of student learning outcomes. The pilot suggested that given proper support for a PLC change initiative, faculty participants are able to develop collaborative relationships with their peers and that student pre and post assessment data resulted in gains of student learning. The present study will incorporate what was learned from the pilot year and document the change initiative during the initial implementation year (2014).
I. A great deal of curiosity and interest in PLCs was sparked by Senge's reintroduction of "learning organizations" in his seminal book The Fifth Discipline in 1990. "The most successful corporation of the future will be a learning organization"(Senge, 1990). "An effective professional learning community has the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning" (Stoll et al., 2006; Sigurdardottir, 2010). The five dimensions of professional learning communities stating that PLCs are supportive and share leadership, have shared values and vision focusing on pupil learning, learn collectively, have supportive conditions, and share personal practice (Hord, 1997, 2004). Professional learning communities are defined as; a group of professionals sharing common goals and purposes, constantly gaining new knowledge through interaction with one another and aiming to improve practices (Sigurdardottir, 2010).
II. The framework of the qualitative case study is based on the work of Shirley M. Hord's (1997; 2004) five attributes of PLCs; I) supportive and shared Leadership; 2) shared values and vision; 3) collective learning and the application of that learning, 4) shared practice and 5)) supportive conditions and on the Six Key Principles of PLCs identified by the National Commission on Teaching and America's Future (NCTAF) (I) Shared Values & Goals; (2) Collective Responsibility; (3) Authentic Assessment; (4) Self-Directed Reflection; (5) Stable Settings; and (6) Strong Leadership Support. The present study will use the Hord's (1997) framework as well as the Six Key Principles of PLC's identified by NCTAF (2010) to analyze the collected data. Data will be sifted through the two frameworks to investigate where the school is in the implementation of the change initiative. The researcher will also explore next steps for sustaining the initiative and the school as a PLC. The researcher will use semi-structured interviews based on Six Principles of Professional Learning Communities identified by NCTAF; the researcher will also use the School Professional Learning Community Survey (Hord, 1997, 2004). Interview data will be collected using a digital recorder. Questionnaire data will be collected through a digital survey program, Qualtrics. Interview and survey data will be coded and analyzed using Atlas TI computer software.
III. The expected results is that teachers who work in the collaborative culture of professional learning communities are participating in action research that is influencing their teaching practices and resulting in increased student achievement.
IV. Although there is vast research in regards to the relationship between PLC's and positive changes in teaching practices and student learning, there are only a few studies and no empirical studies which focus on how to use PLC's to inspire change in primary schools. The literature suggests that further documentation of studies related to schools and in particular primary schools in DoDEA are useful for the advancement of the current PLC research base as well as for DoDEA schools. The study is significant due to the fact that it is designed to test the qualities and practices of effective Professional Learning Teams. Findings will validate the utilization of PLT practices in Pre-K through First Grade classrooms and will further develop the knowledge base and deepen the understanding of ways the practices can be implemented to ensure Continuous School Improvement and highest student achievement.

9. **PURPOSE.**
a. Clearly state all of the objectives, goals, or aims of this project.

The proposed study will explore promoting and sustaining change efforts in school organizations using a Professional Learning Community (PLC) theoretical context. Research suggests that organizations which operate as a PLC have been successful at planning and implementing change initiatives wanted by schools. Sustainability of change initiatives can be difficult, but by using a theoretical framework and closely monitoring these changes over time, schools can glean how well they are succeeding at the change (Stoll, Bolam, McMahon, Thomas, Wallace, Greenwood, & Hawkey, 2006).
Qualitative research methodology will be used to guide the study. This is a case study (Yin, 2014) which will be grounded in survey data, interviews, focus groups and documents related to the change initiative. The researcher will be examining the use of differentiated instruction, common formative assessment and collaborative practices of the school faculty to determine the present status of the change initiative. The researcher will also seek to determine if there are next steps for the school as a PLC. Because sustainability for the change initiative and the PLC are critical outcomes, the researcher will also seek to determine if next steps and recommendations which can be made for the school.
1. What is the nature of Professional Learning Communities in Angel Primary School?
2. How has the implementation of Professional Learning Communities in Angel Primary School changed instructional practices?
3. How do the teaching practices developed as a result of the Professional Learning Community relate to student learning outcomes in Angel Pri

b. How will the results of this project be used? (e.g., Presentation? Publication? Thesis? Dissertation?)
Dissertation

10a. **KEY PERSONNEL.** Describe responsibilities. Include information on research training or certifications related to this project. **CITI is required.** **Be as specific as possible.** (Attach extra page if needed.) *All non AU-affiliated key personnel must attach **CITI certificates of completion.***

Principle Investigator Lynn E. Irwin **Title:** Graduate Student **E-mail address** lei0001@auburn.edu
Dept / Affiliation: EFLT

Roles / Responsibilities:
The purpose of this individual will be to serve as a researcher gathering data and reviewing the data in order to get the desired outcome of the study. Data will be collected from interviews and surveys conducted with the faculty of Ft. Rucker Primary School in Ft. Rucker, AL. Citi training has been completed in order to conduct the requested research.

Individual: Ellen H. Reames **Title:** Chair **E-mail address** reamseh@auburn.edu
Dept / Affiliation: EFLT

Roles / Responsibilities:
The faculty advisor will oversee the advising of the project and providing assistance with data collection, analysis, and reporting findings.

Individual: _____ **Title:** _____ **E-mail address** _____
Dept / Affiliation: _____

Roles / Responsibilities:

Individual: _____ **Title:** _____ **E-mail address** _____
Dept / Affiliation: _____

Roles / Responsibilities:

Individual: _____ **Title:** _____ **E-mail address** _____
Dept / Affiliation: _____

Roles / Responsibilities:

Individual: _____ **Title:** _____ **E-mail address** _____
Dept / Affiliation: _____

Roles / Responsibilities:

11. **LOCATION OF RESEARCH. List all locations where data collection will take place.** (School systems, organizations, businesses, buildings and room numbers, servers for web surveys, etc.) **Be as specific as possible. Attach permission letters in Appendix E.**
[See sample letters at http://www.auburn.edu/research/vpr/ohs/sample.htm]
Ft. Rucker Primary School GA/ALA District Department of Defense Education Activity (DoDEA) Classroom Teachers 2013-2014 School Year. District Superintendent, Dr. Christy Cabezus, has been contacted and has given permission for the research to be conducted with school personnel. All documents required by DoDEA have also been completed and submitted for research approval. CITI training was completed on September 4, 2013.

12. PARTICIPANTS.

a. **Describe the participant population you have chosen for this project.**

✓ **Check here if there is existing data; describe the population from whom data was collected & include the # of data files.**

The teaching staff at Ft. Rucker Primary School consists of three Pre-K teachers, six Kindergarten teachers, six First Grade teachers and two Remedial Reading teachers. All will participate in the study.

The study will use existing student learning data from the 2012/13 pilot year and student data collected during 2013/14. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012 and the Benchmark Assessment System (BAS) developed by Fountas and Pinnell. The data is maintained in a school digital database that is password protected and only accessible to individuals with Common Access Cards that have been subject to government background checks. In addition, the data is only available as school-wide data with no student names as identifiers. The student learning data will reflect progress made by the school as a whole in the area of reading comprehension. No other student data will be used.

b. **Describe why is this participant population is appropriate for inclusion in this research project.** (Include criteria for selection.)

During the 2012-2013 school year, one Ft. Rucker primary school (Pre-K through 1st Grade) piloted a Professional Learning Community (PLC) change initiative focused on bringing about positive change in instruction and assessment that would encourage improvement of student learning outcomes. The pilot suggested that given proper support for a PLC change initiative, faculty participants were able to develop collaborative relationships with their peers, and student pre and post assessment data resulted in gains of student learning. The present study will incorporate what was learned from the pilot year and document the change initiative during the initial implementation year (2014). The entire school faculty will participate.

Student learning data from SY 2012 through 2014 will be used to investigate the relationship between PLC practices and student achievement.

c. **Describe, step-by-step, all procedures you will use to recruit participants.** *Include in Appendix B a copy of all e-mails, flyers, advertisements, recruiting scripts, invitations, etc., that will be used to invite people to participate.*
(See sample documents at http://www.auburn.edu/research/vpr/ohs/sample.htm.)

I will make contact with Dr. Christy Cabezus, superintendent of GA/ALA School District, seeking permission to interview school personnel. Once that permission has been granted, I will meet with Dr. Debbie Deas, principal of Ft. Rucker Primary School, to set up time lines and to discuss protocols for the study. I will then send out a letter to Ft. Rucker Primary School faculty explaining the purpose of the study and the interview and survey processes and requesting participant volunteers for the study. It will be made clear through the letter that all data collected will be kept confidential and that participants are free to withdraw from the study at any time. Potential participants will also be made aware that they are not committed to answer any questions they feel uncomfortable answering.

What is the minimum number of participants you need to validate the study? [1] _____

Is there a limit on the number of participants you will recruit? ☑ No ☐ Yes – the number is _____

Is there a limit on the number of participants you will include in the study? ☑ No ☐ Yes – the number is _____

d. **Describe the type, amount and method of compensation and/or incentives for participants.**
(If no compensation will be given, check here .)

Select the type of compensation: — Monetary — Incentives
— Raffle or Drawing incentive (Include the chances of winning.)
— Extra Credit (State the value)
— Other

Description:

13. **PROJECT DESIGN & METHODS.**

a. **Describe, step-by-step, all procedures and methods that will be used to consent participants.**
(— Check here if this is "not applicable"; you are using existing data.)
I will mail an explanation letter and consent form to potential participants. The letter will explain the purpose and format of their role in the study. Participants will be informed in the letter that they aren't committed to answering every question during the interviews or on the survey and that they are free to withdraw from the study at any time. My contact information along with that of the school principal and the district superintendent will be included and potential participants will be encouraged to seek answers to any questions that may arise at any time.

b. **Describe the procedures you will use in order to address your purpose. Provide a step-by-step description of how you will carry out this research project.** Include specific information about the participants' time and effort commitment. (*NOTE: Use language that would be understandable to someone who is not familiar with your area of study. Without a complete description of all procedures, the Auburn University IRB will not be able to review this protocol. If additional space is needed for this section, save the information as a .PDF file and insert after page 6 of this form.*)

The framework of the case study is based on the work of Shirley M. Hord's (1997; 2004) five attributes of PLCs; I) supportive and shared Leadership; 2) shared values and vision; 3) collective learning and the application of that learning, 4) shared practice and 5)) supportive conditions and on the Six Key Principles of PLCs identified by the National Commission on Teaching and America's Future (NCTAF) (I) Shared Values & Goals; (2) Collective Responsibility; (3) Authentic Assessment; (4) Self-Directed Reflection; (5) Stable Settings; and (6) Strong Leadership Support. The present study will use the Hord & Sommers framework as well as the Six Key Principles of PLC's identified by National Commission on Teaching and America's Future (NCTAF, 2010) to analyze the collected data. The researcher will use the 2 frameworks to sift data to determine where the school is in the implementation of the change initiative. In addition, the researcher will explore next steps for sustaining the initiative and the school as a PLC. The researcher will use semi-structured interviews based on Six Principles of Professional Learning Communities identified by NCTAF;. The researcher will also use the School Professional Learning Community Survey (Hord, 1997, 2004).
Interviews and surveys will be conducted in a Pre/Post format in Sept. and May. Surveys will be administered electronically and made readily available to all participants for a two week period of time during both administrations. Interviews will be scheduled at the participants convenience.

13c. List all data collection instruments used in this project, in the order they appear in Appendix C.
(e.g., surveys and questionnaires in the format that will be presented to participants, educational tests, data collection sheets, interview questions, audio/video taping methods etc.)

Interview questions
School Professional Staff as Learning Community/Collective Efficacy Scale Questionnaire (Hord, 2004)
Ft. Rucker Professional Learning Community Survey

Student Achievement Data will be used:
The study will use existing student learning data from the 2012/13 pilot year and student data collected during 2013/14. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012 and the Benchmark Assessment System (BAS) developed by Fountas and Pinnell. The data is maintained in a school digital database that is password protected and only accessible to individuals with Common Access Cards that have been subject to government background checks. In addition, the data is only available as school-wide data with no student names as identifiers. The student learning data will reflect progress made by the school as a whole in the area of reading comprehension. No other student data will be used.

d. Data analysis: Explain how the data will be analyzed.
The researcher will use semi-structured interviews based on Six Principles of PLCs identified by NCTAF as well as The Stages of Concern Questionnaire and The School Professional Learning Community Survey (Hord, 1997, 2004). Interview data will be collected using a digital recorder. Questionnaire data will be collected through a digital survey program, Qualtrics. Interview and survey data will be coded and analyzed using Atlas TI computer software. Documents, such as faculty meeting minutes, will be examined for supporting research question evidence. School-wide beginning and end of year student achievement data will be compared to reveal gains in reading comprehension.

14. RISKS & DISCOMFORTS: List and describe all of the risks that participants might encounter in this research. ***If you are using deception in this study, please justify the use of deception and be sure to attach a copy of the debriefing form you plan to use in Appendix D.*** *(Examples of possible risks are in section #6D on page 1.)*

There should be no discomforts encountered by participants because they can withdraw at any time and student achievement is only generated as school-wide data and individual students aren't identified in data collection.

15. **PRECAUTIONS.** Identify and describe all precautions you have taken to eliminate or reduce risks as listed in #14. If the participants can be classified as a "vulnerable" population, please describe additional safeguards that you will use to assure the ethical treatment of these individuals. ***Provide a copy of any emergency plans/procedures and medical referral lists in Appendix D.***

The participants are not vulnerable populations. All participants will be informed through the cover letter that they do not have to answer any questions they do not wish to answer and can withdraw at any time. I will use no real names of participants.

Student Achievement Data will be used:
The study will use existing student learning data from the 2012/13 pilot year and student data collected during 2013/14. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012 and the Benchmark Assessment System (BAS) developed by Fountas and Pinnell. The data is maintained in a school digital database that is password protected and only accessible to individuals with Common Access Cards that have been subject to government background checks. In addition, the data is only available as school-wide data with no student names as identifiers. The student learning data will reflect progress made by the school as a whole in the area of reading comprehension. No other student data will be used.

If using the Internet to collect data, what confidentiality or security precautions are in place to protect (or not collect) identifiable data? Include protections used during both the collection and transfer of data.
(These are likely listed on the server's website.)

Qualtrics will be used for survey administration and data collection. The survey will be aggregate to all participants. Participants will not be coded in any way. The files will be secured on one computer and the password protected with compression software.

16. **BENEFITS.**

a. **List all realistic direct benefits participants can expect by participating in this specific study.**
(Do not include "compensation" listed in #12d.) Check here if there are no direct benefits to participants.

Because the study takes place during and investigates outcomes of an implementation year of a change initiative, participants will have the opportunity to learn alongside the researcher. Participants will:

* Broaden understanding and deepen knowledge of practices of PLCs and PLC frameworks
* Receive training in and have opportunities to administer the common formative assessment
* Have opportunities for collaboration for the purpose of analyzing student learning data
* Have opportunities for collaboration for the purpose of using student learning data to inform instruction

b. **List all realistic benefits for the general population that may be generated from this study.**

Participants will have opportunities to participate in professional learning communities which could potentially lead to positive changes in their own instructional practices. Participants will also be provided the opportunity to work in a culture with increased collaboration related to their own students learning.

17. **PROTECTION OF DATA.**

a. **Will data be collected as anonymous?** ☐ Yes ☑ No *If "YES", skip to part "g".*
("Anonymous" means that you will not collect any identifiable data.)

b. **Will data be collected as confidential?** ☑ Yes ☐ No
("Confidential" means that you will collect and protect identifiable data.)

c. **If data are collected as confidential, will the participants' data be coded or linked to identifying information?**
■ Yes (If so, describe how linked.) No ■
Student Achievement Data will be used:
The study will use existing student learning data from the 2012/13 pilot year and student data collected during 2013/14. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012 and the Benchmark Assessment System (BAS) developed by Fountas and Pinnell. The data is maintained in a school digital database that is password protected and only accessible to individuals with Common Access Cards that have been subject to government background checks. In addition, the data is only available as school-wide data with no student names as identifiers. The student learning data will reflect progress made by the school as a whole in the area of reading comprehension. No other student data will be used.

d. **Justify your need to code participants' data or link the data with identifying information.**
Survey responses will not be linked to interview responses in any way.

e. **Where will code lists be stored?** (Building, room number?)

f. **Will data collected as "confidential" be recorded and analyzed as "anonymous"?** ☑ Yes ☐ No
(If you will maintain identifiable data, protections should have been described in #15.)

g. **Describe how and where the data will be stored** (e.g., hard copy, audio cassette, electronic data, etc.), **and how the location where data is stored will be secured in your absence. For electronic data, describe security. If applicable, state specifically where any IRB-approved and participant-signed consent documents will be kept on campus for 3 years after the study ends.**

Non-digital materials will be kept in a filing cabinet in the principle investigator's classroom at Ft. Rucker Primary School. Digital recordings will be located on one password protected computer. The files will be encrypted. All digital files will be deleted June 1, 2014.

h. **Who will have access to participants' data?**
(The faculty advisor should have full access and be able to produce the data in the case of a federal or institutional audit.)
The investigator and advisor.

i. **When is the latest date that confidential data will be retained?** (Check here if only anonymous data will be retained. ✓)
June 1, 2014

j. **How will the confidential data be destroyed?** *(NOTE: Data recorded and analyzed as "anonymous" may be retained indefinitely.)*

All data will be anonymous; however, non-digital data will be shredded and recordings and digital data will be deleted.

Appendix 2

DoDEA Institutional Review Board Approval

DEPARTMENT OF DEFENSE
EDUCATION ACTIVITY
4800 MARK CENTER DRIVE
ALEXANDRIA, VA 22350-1400

13 November 2013

Lynn Irwin
3396 County Road 157
Enterprise, AL 36330

Dear Ms. Irwin,

Your research proposal, "An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration" has been reviewed by the DoDEA research committee. We are happy to grant approval for you to conduct your research as specified in DoDEA schools. Specifically, you have approval to use student data generated from the Common Formative Retell Assessment and conduct pre and post surveys of staff at Ft. Rucker Primary School.

Please note the following conditions: 1) You must obtain permission from all individuals that you interview, and permission forms should clearly indicate that the study is not sponsored by DoDEA or the school and are solely for your personal research purposes, 2) The completion of all surveys must be conducted outside the normal duty day, and 3) Any supplies, such as paper or the use of the copier, should not be used for your personal research.

Any additional information you request from schools or individuals or any deviations from your original proposal should be cleared through DoDEA HQ and your university IRB. Permission from DoDEA HQ does not compel any individual(s) to participate in the research; participation by individuals, including school personnel and students, is strictly voluntary and all activities associated with the research must be conducted outside the duty day.

As specified in the research agreement, you may not refer to the specific school, district, or school system (DDESS, DODDS, or DoDEA) in any way in any written reports generated from this research, including your dissertation. Also be aware that you should contact the DoDEA Office of General Counsel before presenting or publishing your findings. A final electronic copy of your research report is to be submitted to the DoDEA Research and Evaluation Branch via email or regular mail. Best of luck with your research, if you have any further questions please feel free to contact me via email or phone at (571) 372-6006.

Sincerely,

sandra.embler@hq.dodea.edu

Digitally signed by sandra.embler@hq.dodea.edu
DN: cn=sandra.embler@hq.dodea.edu
Date: 2013.11.14 15:23:40 -05'00'

Sandra D. Embler, Ph.D.
Chief, Research and Evaluation

RESEARCH STUDY REQUEST

OMB No. 0704-0457
OMB approval expires
Feb 29, 2012

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ORGANIZATION. RETURN COMPLETED FORM TO:
DoD Education Activity, Research and Evaluation Branch, 9th Floor, 4040 N. Fairfax Drive, Arlington, VA 22203

PRIVACY ACT STATEMENT

AUTHORITY: Sections 10 U.S.C. 113, Secretary of Defense; 10 U.S.C. 2164, Department of Defense Elementary and Secondary Schools; and 20 U.S.C. 921-932, Overseas Defense Dependent's Education.
PRINCIPAL PURPOSE(S): To maintain a case file for use by management concerning any research project undertaken concerning DoDEA students, parents/sponsors, faculty or staff; and to permit identification and tracking of authorized research projects and researchers.
ROUTINE USE(S): In addition to disclosures generally permitted under 5 U.S.C. 552a(b) of the Privacy Act, these records or information contained therein may specifically be disclosed under the DoD "Blanket Routine Uses" set forth at the beginning of the OSD's compilation of systems of records notices.
DISCLOSURE: Voluntary; however, failure to disclose the information may prevent individuals from conducting research involving DoDEA.

1. NAME *(Last, First, Middle Initial)*	2. DATE *(YYYYMMDD)*
Irwin, Lynn, E.	20130924

3. ADDRESS *(Include ZIP Code)*
3396 County Road 157 Enterprise, AL 36330

4. TELEPHONE NUMBERS *(Include Area Code)*

a. HOME	b. WORK
334-494-2280	334-255-2822

5. FAX NUMBER *(Include Area Code)*	6. E-MAIL ADDRESS
770-268-7483	lynn.irwin@am.dodea.edu

7. ARE YOU CURRENTLY EMPLOYED BY THE DEPARTMENT OF DEFENSE EDUCATION ACTIVITY?
[X] YES IF YES, WHAT IS YOUR CURRENT ASSIGNMENT *(School and District)*
[ ] NO Ft. Rucker Primary School GA/ALA District

8. TITLE OF RESEARCH
An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration

9. PROPOSAL ABSTRACT
The proposed study will explore promoting and sustaining change efforts in school organizations using a Professional Learning Community (PLC) theoretical context. Research suggests that organizations which operate as a PLC have been successful at planning and implementing change initiatives wanted by schools. Sustainability of change initiatives can be difficult but by using a theoretical framework and closely monitoring these changes over time, schools can glean how well they are succeeding at the change (Stoll, Bolam, McMahon, Thomas, Wallace, Greenwood, & Hawkey, 2006).
During the 2012-2013 school year, one Ft. Rucker primary school (Pre-K through 1st Grade) piloted a Professional Learning Community (PLC) change initiative focused on bringing about positive change in instruction and assessment that would encourage improvement of student learning outcomes. The pilot suggested that given proper support for a PLC change initiative, faculty participants were able to develop collaborative relationships with their peers, and student pre and post assessment data resulted in gains of student learning. The present study will incorporate what was learned from the pilot year and document the change initiative during the initial implementation year (2014). The entire school faculty will participate.
Although there is vast research in regards to the relationship between PLC's and positive changes in teaching practices and student learning, there are only a few studies which focus on how to use PLC's to inspire change in primary schools. The literature suggests that further documentation of studies related to schools and in particular primary schools in DoDEA are useful for the advancement of the current PLC research base as well as for DoDEA schools.
A great deal of interest in PLC's was sparked by Senge's (1990) reintroduction of learning organizations. Senge stated,"The most successful corporation of the future will be a learning organization." (Senge, 1990). During the late 1990's the PLC was introduced to K-12 schools throughout the United States by Senge and others (Hord, 1998; Dufour, Dufour & Eaker, 2004). Deeply established school PLC's were found to have the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing pupil learning (Stoll et al., 2006; Sigurdardottir, 2010).
PLC's are defined as a group of professionals sharing common goals and purposes, gaining new knowledge through work with one another, and aiming to improve practices (Sigurdardottir, 2010). Leading authority of PLC's, Hord (1997; 2004), has contended that PLC's can be successful if the following framework is in place: I) supportive and shared Leadership; 2) shared values and vision; 3) collective learning and the application of that learning, 4) shared practice and 5) supportive conditions for the maintenance of the learning community. The present study will use the Hord & Sommers framework as well as the Six Key Principles of PLC's identified by National Commission on Teaching and America's Future to analyze the collected data.

10. EXPLAIN HOW YOUR RESEARCH STUDY (1) IS ALIGNED WITH THE DEPARTMENT OF DEFENSE EDUCATION ACTIVITY (DoDEA) COMMUNITY STRATEGIC PLAN, AND (2) WILL BENEFIT DoDEA.

The purpose of the present study is to explore practices developed by a DoDEA primary school PLC. Specifically, the researcher wanted to determine how well collaboration, the use of differentiated instruction and common formative assessment were being accepted and implemented by faculty. Finally, the researcher wanted to see if these implemented practices would be related to increased student learning measures. The student learning measure which will be used in this study is the Common Formative Retell Assessment created by those faculty members involved in the DoDEA school pilot year. No other student data is used. Because the study focuses on examining implementation of practices that may improve teaching and learning, it closely aligns with Goals 1 and 2 of the DoDEA Community Strategic Plan. This study originated as a pilot using a DoDEA PLC grant. The present study, which is an expansion of this pilot, creates awareness of the effects of collaboration, the use of common formative assessment data to inform instruction and learning styles differentiated instruction. The study may also serve to identify a PLC model and framework that can be used by other DoDEA PLC's to increase teacher effectiveness, student achievement outcomes and a positive means to support change initiatives in DoDEA schools.

11. WHAT IS (ARE) THE RESEARCH QUESTIONS OR MAJOR HYPOTHESIS TO BE TESTED?

Qualitative research methodology will be used to guide the study. This is a case study (Yin, 2014) which will be grounded in survey data, interviews, focus groups and documents related to the change initiative. The researcher will be examining the use of differentiated instruction, common formative assessment and collaborative practices of the school faculty to determine the present status of the change initiative. The researcher will also seek to determine if there are next steps for the school as a PLC. Sustainability for the change initiative and the PLC are critical outcomes so the researcher will also seek to determine if there are next steps and recommendations which can be made for the school.

In qualitative studies, questions are used to guide the researcher's work. The following questions will be used to guide the present study:

1. How has the implementation of Professional Learning communities changed instructional practices?
2. What pedagogical practices that improved instruction were found through the use of the PLC structure?
3. How do the teaching practices developed as a result of the PLC affect student learning outcomes?

12. DESCRIBE THE POPULATION AND/OR SAMPLE TO BE STUDIED.

(1) SAMPLE	(2) NUMBER	(3) DESCRIPTION *(Grades, Schools, Demographics)*
a. STUDENTS		
b. ADMINISTRATION		
c. STAFF/OTHERS	17	The teaching staff at Ft. Rucker Primary School consists of three Pre-K teachers, six Kindergarten teachers, six First Grade teachers and two Remedial Reading teachers. All will participate in the study.
d. SPONSORS/ GUARDIANS		

13. DESCRIBE YOUR PLANS FOR CONDUCTING THE STUDY INCLUDING ADMINISTRATION OF INSTRUMENTS, OTHER DATA COLLECTION ACTIVITIES, AND THE TIMETABLE YOU WILL FOLLOW. *(Include a copy of all questionnaires, surveys, exams, interview protocols, etc. you plan to use.)*

(1) PARTICIPANTS	(2) INSTRUMENT/ TYPE OF DATA COLLECTED	(3) AMOUNT OF TIME REQUIRED	(4) TIMELINE
a. STUDENTS	The study will use existing student learning data from the 2012 pilot year and student data collected during 2014. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012. No other student data will be used.	4 Hours	Aug., Jan., May
b. ADMINISTRATION			
c. STAFF/OTHERS	Pre/ Post administration of the Stages of Concern Questionaire and the Professional Learning Communities Survey	40-60 Minutes	Sept.- May
d. SPONSORS/ GUARDIANS			

14. DESCRIBE WHAT, IF ANY, SPECIFIC RESOURCES YOU WILL NEED FROM DoDEA *(e.g. materials, room, mailbox, etc.).*

The Ft. Rucker Primary School Common Formative Retell Assessment materials to include protocols, rubrics, leveled books, and analyzing student work forms.

15. IF REQUESTING DATA FROM DoDEA, DESCRIBE IN DETAIL THE DATA YOU ARE REQUESTING *(e.g. demographics, sample size, specific measures, etc.).*

16. FOR EACH RESEARCH QUESTION LISTED, DESCRIBE IN DETAIL THE SPECIFIC ANALYTIC PROCEDURES THAT WILL BE USED.

1. How has the implementation of Professional Learning Communities changed instructional practices?
The researcher will use semi-structured interviews based on Six Principles of Professional Learning Communities identified by NCTAF; (I) Shared Values & Goals; (2) Collective Responsibility; (3) Authentic Assessment; (4) Self-Directed Reflection; (5) Stable Settings; and (6) Strong Leadership Support. I will also use the School Professional Learning Community Survey (Hord, 1997, 2004). Interview data will be collected using a digital recorder. Questionnaire data will be collected through a digital survey program, Qualtrics. Interview and survey data will be coded and analyzed using Atlas TI computer software. Documents, such as faculty meeting minutes, will be examined for supporting research question evidence. All data will be maintained in secured files on a networked computer.

2. What pedagogical practices that improved instruction were found through the use of the PLC structure?
The researcher will use semi-structured interviews based on Six Principles of Professional Learning Communities identified by NCTAF; (I) Shared Values & Goals; (2) Collective Responsibility; (3) Authentic Assessment; (4) Self-Directed Reflection; (5) Stable Settings; and (6) Strong Leadership Support. The researcher will also use the School Professional Learning Community Survey (Hord, 1997, 2004). Interview data will be collected using a digital recorder. Questionnaire data will be collected through a digital survey program, Qualtrics. Interview and survey data will be coded and analyzed using Atlas TI computer software. Documents, such as faculty meeting minutes, will be examined for supporting research question evidence. All data will be maintained in secured files on a networked computer.

3. How do the teaching practices developed as a result of the PLT affect student learning outcomes?
The researcher will use semi-structured interviews based on Six Principles of Professional Learning Communities identified by NCTAF: 1) Shared Values & Goals; 2) Collective Responsibility; 3) Authentic Assessment; 4) Self-Directed Reflection; 5) Stable Settings; and 6) Strong Leadership Support. The researcher will also use the School Professional Learning Community Survey (Hord, 1997, 2004). Interview data will be collected using a digital recorder. Questionnaire data will be collected through a digital survey program, Qualtrics. Interview and survey data will be coded and analyzed using Atlas TI computer software. Documents, such as faculty meeting minutes, will be examined for supporting research question evidence. All data will be maintained in secured files on a networked computer.

17. IN WHAT FORM(S) AND TO WHOM WILL YOU REPORT YOUR FINDINGS?

I will report the findings of this Dissertation Study to the following Dissertation Committtee:

Auburn University
College of Educational Foundations Leadership and Technology

Major Professor: Dr. Ellen Reames, Professor
Educational Foundations Leadership and Technology
reamseh@auburn.edu

Committee Member 1: Dr. Frances Kochan, Professor
Educational Foundations Leadership and Technology
kochafr@auburn.edu

Committee Member 2: Dr. James Witte, Professor
Educational Foundations Leadership and Technology
witteje@auburn.edu

Committee Member 3: Dr. Maria Martinez Witte, Professor
Educational Foundations Leadership and Technology
wittemm@auburn.edu

18. DATE COLLABORATIVE INSTITUTIONAL TRAINING INITIATIVE (CITI) TRAINING WAS COMPLETED *(YYYYMMDD)* 20130904

19. ATTACHMENTS *(X all the items below which you are attaching to this application.)*

- [X] A COPY OF THE INSTITUTIONAL REVIEW BOARD (IRB) FOR HUMAN SUBJECTS *(Required).*
- [X] CONSENT FORMS *(Required if study includes data collected from human subjects).*
- [X] INSTRUMENTS TO BE USED *(Surveys, interview questions, observation forms, etc.) (Required if used in study).*
- [X] OTHER *(Specify):*

CITI training was completed under an organization other than the Office of the Undersecretary of Defense. The training was completed through an affiliation with Auburn University. Training certificates are included in the attachment.

References

Hord, S.M. (1997). *Professional learning communities: Communities of Continuous Inquiry and Improvement.* Austin, Texas: Southwest Educational Development Laboratory.

Hord, S. (2004). *Professional Learning Communities: An Overview. In S. Hord (Ed), Learning Together, Leading Together: Changing Schools Through Professional Learning Communities.* New York: Teachers College Press.

Peter M. Senge (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Doubleday Currency.

Sigurdardottir, Anna Kristen (2010). Professional Learning Community in Relation to School Effectiveness. *Scandinavian Journal of Educational Research,*54(5). 395-412.

Stoll, L., Bolam, R., McMahon, A., Thomas, S., Wallace, M., Greenwood, A. & Hawkey, K. (2006). *Professional Learning Communites: Source Materials for School Leaders and Other Leaders of Professional Learning.* London: Innovation Unit, DfES, NCSL and GTC.

Yin, R. K. (1994). *Case study research: Design and methods* (2nd ed.). Newbury Park, CA: Sage Publications.

RESEARCH AGREEMENT

Guidelines:

1. Research shall be conducted in accordance with DoDEA Administrative Instruction (2071.3).

2. Research involving pupils, sponsors and/or personnel of the Department of Defense Education Activity (DoDEA) must protect the dignity, well-being, and confidentiality of the individual(s), including the rights guaranteed legally and constitutionally and by DoDEA policies.

3. The researcher shall inform all participants (i.e. students, sponsors/guardians, DoDEA personnel) that participation in the proposed research is voluntary.

4. The researcher shall obtain informed consent from participants of legal age; and will obtain informed assent from participants and consent from a sponsor/guardian when participants are not of legal age, unless a waiver is obtained.

5. Personal, social, and psychological research of any nature must NOT be in conflict with the rights of individuals or groups.

6. The researcher shall obtain permission for all information collections as required under Public Law 104-13, "Paperwork Reduction Act of 1995" and DoD Directive 8910.1, "Management and Control of Information Requirements," June 11, 1993.

7. All information obtained will be held in accordance with the Privacy Act (5 USC 552a).

8. The research shall not unduly interfere with the classroom instructional process or the regular operations of the school or district.

9. The researcher shall cooperate with the staff member(s) designated by the district or school to coordinate the research. It is the researcher's responsibility to become familiar with DoDEA operating policies.

10. Researchers are not to refer to the specific military installation, the names or locations of the schools, or the name of the school system (DoDEA, Domestic Dependent Elementary and Secondary Schools (DDESS), or Department of Defense Dependents Schools (DoDDS)) in any reports generated from this research. It may only be stated that the study was conducted in a school that serves children of military sponsors. In addition, there must not be any association with the DoDEA on surveys, letters, documents, etc. (e.g. Government letterhead, name of installation, etc.).

11. The researcher shall submit an electronic copy of the final research report to the Chief, Research and Evaluation, DoDEA.

12. The Principal, Superintendent, Area Deputy Director, Chief, Research and Evaluation Branch, or the Director, DoDEA may terminate a research study that receives permission at any time.

13. Permission to conduct research is not an endorsement and does not compel any personnel of the DoDEA to participate in research studies.

I acknowledge receipt of the Guidelines for Research in DoDEA and agree to abide by the guidelines as stated.

1. SIGNATURE OF RESEARCHER	2. DATE *(YYYYMMDD)*
Lynn E. Mann	

DoDEA FORM 2071.3-F2, FEB 2009 Adobe Designer 8.0

RESEARCH SPONSOR

1. RESEARCHER
Irwin, Lynn E.

2. STUDY TITLE

An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration

THE FOLLOWING SECTION TO BE COMPLETED BY INDIVIDUALS CONDUCTING RESEARCH UNDER THE DIRECTION OF A FACULTY OR STAFF SPONSOR. ALL OTHER INDIVIDUALS SHOULD ATTACH A CURRENT CURRICULUM VITA OR BIOSKETCH.

3. FACULTY OR STAFF SPONSOR

a. NAME *(Last, First, Middle Initial)*
Reames, Ellen

b. ADDRESS *(Include ZIP Code)*
4036 Haley Center
Auburn Univ, AL 36849

c. TELEPHONE NUMBER *(Include Area Code)*	d. E-MAIL ADDRESS
Phone: (334) 844-4460	reamseh@auburn.edu

e. UNIVERSITY/DEPARTMENT/ORGANIZATION
Educational Foundations Leadership and Technology Auburn University

DoDEA FORM 2071.3-F3, MAY 2008

Adobe Designer 7.0

Office of the Under Secretary of Defense (Personnel & Readiness)
Researcher Responsibilities

The Office of the Under Secretary of Defense for Personnel and Readiness requires that all research investigators (principal investigators as well as associate investigators) engaged in research with one of its institutions explicitly acknowledge and accept responsibility for protecting the rights and welfare of human research subjects as stated therein.

---

1. I understand that the rights of the subjects take precedence over the needs of the research and I will protect the rights of human research subjects and will comply with the following: the Belmont Report, 32 CFR 219; 10 USC 980; DoDD 3216.02; where applicable 45 CFR 160 and 164; where applicable 45 CFR 46 (Subparts B, C, and D) under the authority of the DoD; and other Federal, State and local laws as they may relate to proposed human subjects research.

2. I am aware of the Joint Ethics Regulation, DoDI 5500.7-R, specifically areas addressing investigators relationships with sponsoring companies including monies received for research protocols. I understand that financial and other conflicts of interest must be reported to the EDO and/or IRB.

3. I understand that I must have either (a) a written exemption determination from my Exemption Determination Official (EDO) (b) an approval letter from a DoD IRB, or (c) written DoD concurrence with a nonfederal IRB review prior to initiating research.

4. I shall promptly report to the approving authority (EDO or IRB) proposed changes in a research activity and shall ensure that such changes in approved research, during the period for which approval has already been given, are not initiated without proper authority review and approval except when necessary to eliminate apparent immediate hazards to the subject.

5. I will ensure that all subjects, or their representatives, are fully informed of the nature of the research to include potential risks to subjects and I will obtain informed consent from each as required.

6. I will maintain study records for 3 years after the study is closed or for 6 years if the study is regulated by the Health Insurance Portability and Accountability Act.

7. I will respect the privacy of subjects. I shall protect confidential information given to me and advise subjects in advance of any limits upon my ability to ensure that the information will remain confidential.

8. I am aware and will complete the training required by the OUSD(P&R) HRPP prior to initiating research.

9. I will report immediately to the approving authority (EDO or IRB) any unanticipated problems involving risks to subjects or others in research.

Applicable to Biomedical Research Investigators

1. I understand and accept the responsibility for protecting the rights and welfare of human research subjects under the FDA regulations 21 CFR 50, 21 CFR 54, and 21 CFR 56 if applicable.

2. I will not enroll a subject into a study until the study has been approved by the appropriate authority and, when appropriate, the subject's primary care physician has granted approval for him/her to enter a study.

3. I am responsible for assuring the quality of each subject's consent in accordance with current federal regulations. This will include ensuring that any "designee" who obtains consent on my behalf is completely conversant with the protocol and is qualified to perform this responsibility.

4. I will maintain a Study File that must be kept for three years following completion of the study if no IND/IDE used. If IND medication or IDE appliances are used, the file must be kept for 2 years after FDA approval and can then be destroyed; or if no application is filed or approved, until 2 years after the study is discontinued and FDA notified.

5. I will report immediately to the IRB any unanticipated adverse events.

With my signature, I acknowledge that I have read and understand the responsibilities stated above and will comply with them. I understand that if I fail to comply with any of these responsibilities, all protocols for which I am an investigator may be suspended.

Lynn E Irwin _____
Investigator Signature *Date*

Lynn E. Irwin
Print (First Name) (Middle Initial) (Last Name)

3396 County Road 157
Mailing Address

Enterprise AL 36330
(City) *(State/Province)* *(Zip/Country)*

334-494-2280 lynn.irwin@am.dodea.edu
Phone Number *Email Address*

Appendix 3

Permission to Conduct Study

13-339

DEPARTMENT OF DEFENSE
DOMESTIC DEPENDENT ELEMENTARY AND SECONDARY SCHOOLS
GEORGIA / ALABAMA DISTRICT
FORT BENNING SCHOOLS
7441 CUSTER ROAD, BUILDING 2670
FORT BENNING, GEORGIA 31905-9647

October 24, 2013

Institutional Review Board
c/o Office of Human Subjects Research
307 Samford Hall
Auburn University, AL 36849

Dear IRB Members,

After reviewing the proposed study, "An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration in Primary Schools", presented by Mrs. Lynn Irwin, a graduate student at Auburn University, I have granted permission for the study to be conducted at Ft. Rucker Primary School.

The proposed study will explore promoting and sustaining change efforts in school organizations using a Professional Learning Community (PLC) theoretical context. Research suggests that organizations which operate as a PLC have been successful at planning and implementing change initiatives wanted by schools. Sustainability of change initiatives can be difficult, but by using a theoretical framework and closely monitoring these changes over time, schools can glean how well they are succeeding at the change (Stoll, Bolam, McMahon, Thomas, Wallace, Greenwood, & Hawkey, 2006).

Qualitative research methodology will be used to guide the study. This is a case study (Yin, 2014) which will be grounded in survey data, interviews, focus groups and documents related to the change initiative. The researcher will be examining the use of differentiated instruction, common formative assessment and collaborative practices of the school faculty to determine the present status of the change initiative. The researcher will also seek to determine if there are next steps for the school as a PLC. Because sustainability for the change initiative and the PLC are critical outcomes, the researcher will also seek to determine if next steps and recommendations which can be made for the school.
1. What is the nature of Professional Learning Communities in Angel Primary School?
2. How has the implementation of Professional Learning Communities in Angel Primary School changed instructional practices?
3. How do the teaching practices developed as a result of the Professional Learning Community relate to student learning outcomes.

I understand that pre and post surveys and interviews will be conducted. Only teachers who have agreed to participate through the informed consent process will be part of the study and all surveys and interviews will be conducted outside the duty day. No students will be surveyed or interviewed.

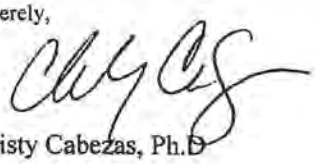
The study will use existing student learning data from the 2012/13 pilot year and student data collected during 2013/14. Collected data is generated from the Common Formative Retell Assessment that was developed by the PLC in 2012 and the Benchmark Assessment System (BAS) developed by Fountas and Pinnell. The data is maintained in a school digital database that is password protected and only accessible to individuals with Common Access Cards that have been subject to government background checks. In addition, the data is only available as school-wide data with no student names as identifiers. The student learning data will reflect progress made by the school as a whole in the area of reading comprehension. No other student data will be used.

I expect that this project will end not later than June 1, 2014. Mrs. Irwin will contact and recruit teachers and will collect data at Ft. Rucker Primary School.

I understand that Mrs. Irwin will receive consent for all participants, and have confirmed that she has the cooperation of the school principal. Mrs. Irwin has agreed to provide to my office a copy of all Auburn University IRB-approved, stamped consent documents before she recruits participants on campus. Any data collected by Mrs. Irwin will be kept confidential and will be stored in a locked filing cabinet in Ft. Rucker Primary School. Mrs. Irwin has also agreed to provide to us a copy of the aggregate results from her study.

If the IRB has any concerns about the permission being granted by this letter, please contact me at the phone number listed below.

Sincerely,



Christy Cabezas, Ph.D
Superintendent
DDESS GA/AL District
7441 Custer Rd Bldg 2670
Ft. Benning, GA 31905
706-545-7276

PRINCIPAL AND SUPERINTENDENT CONSENT

1. PRINCIPAL

a. I have reviewed the Research Study Request for Lynn E. Irwin

b. entitled An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration

c. I *(X one)* [X] agree [ ] disagree that my school will participate in this research study.

I also understand that given my consent, this research will be conducted in accordance with Department of Defense Education Activity (DoDEA) policy.

20130918 — d. Date *(YYYYMMDD)*

Ft. Rucker Primary School — e. School Name

Deas Deborah — f. Principal's Name *(Last, First, Middle Initial)*

Deborah Deas — g. Principal's Signature

Please forward this request to your Superintendent after completion of this form.

2. SUPERINTENDENT

a. I *(X one)* [X] agree [ ] disagree that my school will participate in this research study.

I also understand that given my consent, this research will be conducted in accordance with Department of Defense Education Activity (DoDEA) policy.

20130918 — b. Date *(YYYYMMDD)*

Cabezas, Christy L — c. Superintendent's Name *(Last, First, Middle Initial)*

Christy Cabezas — d. Superintendent's Signature

3. TO BE COMPLETED BY THE PRINCIPAL AND SUPERINTENDENT

If you disagreed above, please state your reasons below.

Superintendent: Return to the DODEA: Chief, Research and Evaluation Branch

Fax: (703) 588-3766

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Appendix 4

Informed Consent

AUBURN UNIVERSITY

COLLEGE OF EDUCATION

EDUCATIONAL FOUNDATIONS, LEADERSHIP AND TECHNOLOGY

INFORMED CONSENT
for a Research Study

You are invited to participate in a research study titled, "An Exploratory Study of a Model Professional Learning Community: A Vehicle for Change and Collaboration". The study is being conducted by Lynn Irwin under the direction of Dr. Ellen Reames in the Auburn University Department of Educational Leadership. You were selected as a possible participant because you are a Ft. Rucker Primary School Teacher and are age 19 or older.

What will be involved if you participate? If you decide to participate in this research study, you will be asked to participate in an interview and complete a survey and questionnaire. Your total time commitment will be approximately three hours.

There are no risks or discomforts associated with this study.

If you participate in this study, you can expect to increase your understanding of the components of Professional Learning Communities. We/I cannot promise you that you will receive any or all of the benefits described.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Educational Leadership or Ft. Rucker Primary School.

4036 Haley Center, Auburn, AL 36849-5221; Telephone: 334-844-4460; Fax: 334-844-3072

www.auburn.edu

Your privacy will be protected. Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill an educational requirement.

If you have questions about this study, please ask them now or contact Dr. Ellen Reames at reamesh@auburn.edu or Lynn Irwin at lynn.irwin@am.dodea.edu. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Human Subjects Research or the Institutional Review Board by phone (334)-844-5966 or e-mail at hsubjec@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date	Investigator obtaining consent Date
Printed Name	Printed Name
	Co-Investigator Date
	Printed Name

The Auburn University Institutional Review Board has approved this document for use from 11/3/13 to 11/2/14 Protocol # 13-339 EP1311

Appendix 5

Ft. Rucker Primary School Professional Learning Team Survey 2013–2014

Ft. Rucker Primary School Professional Learning Team Survey 2013-2014

Default Question Block

Shared and Supportive Leadership

	Strongly Disagree	Disagree	Agree	Strongly Agree
Staff members are consistently involved in discussing and making decisions about most school issues.				
The principal incorporates advice from staff members to make decisions.				
Staff members have accessibility to key information.				
The principal is proactive and addresses areas where support is needed.				
Opportunities are provided for staff members to initiate change.				
The principal shares responsibility and rewards for innovative actions.				
The principal participates democratically with staff sharing power and authority.				
Leadership is promoted and nurtured among staff members.				
Decision-making takes place through committees and communication across grade and subject areas.				
Stakeholders assume shared responsibility and accountability for student learning without evidence of imposed power and authority.				
Staff members use multiple sources of data to make decisions about teaching and learning.				

Shared Values and Vision

	Strongly Disagree	Disagree	Agree	Strongly Agree
A collaborative process exists for developing a shared sense of values among staff.				
Shared values support norms of behavior that guide decisions about teaching and learning.				
Staff members share visions for school improvement that have an undeviating focus on student learning.				
Decisions are made in alignment with the school's values and vision.				
A collaborative process exists for developing a shared vision among staff.				
School goals focus on student learning beyond test scores and grades.				
Policies and programs are aligned to the school's vision.				
Stakeholders are actively involved in creating high expectations that serve to increase student achievement.				

Data are used to prioritize actions to reach a shared vision.				

Collective Learning and Application

	Strongly Disagree	Disagree	Agree	Strongly Agree
Staff members work together to seek knowledge, skills and strategies and apply this new learning to their work.				
Collegial relationships exist among staff members that reflect commitment to school improvement efforts.				
Staff members plan and work together to search for solutions to address diverse student needs.				
A variety of opportunities and structures exist for collective learning through open dialogue.				
Staff members engage in dialogue that reflects a respect for diverse ideas that lead to continued inquiry.				
Professional development focuses on teaching and learning.				
School staff members and stakeholders learn together and apply new knowledge to solve problems.				
School staff members are committed to programs that enhance learning.				
Staff members collaboratively analyze multiple sources of data to assess the effectiveness of instructional practices.				
Staff members collaboratively analyze student work to improve teaching and learning.				

Shared Personal Practice

	Strongly Disagree	Disagree	Agree	Strongly Agree
Opportunities exist for staff members to observe peers and offer encouragement.				
Staff members provide feedback to peers related to instructional practices.				
Staff members informally share ideas and suggestions for improving student learning.				
Staff members collaboratively review student work to share and improve instructional practices.				
Opportunities exist for coaching and mentoring.				
Individuals and teams have the opportunity to apply learning and share the results of their practices.				
Staff members regularly share student work to guide overall school improvement.				

Supportive Conditions- Relationships

	Strongly Disagree	Disagree	Agree	Strongly Agree
Caring relationships exist among staff and students that are built on trust and respect.				

A culture of trust and respect exists for taking risks.				
Outstanding achievement is recognized and celebrated regularly in our school.				
School staff and stakeholders exhibit a sustained and unified effort to embed change into the culture of the school.				
Relationships among staff members support honest and respectful examination of data to enhance teaching and learning.				

Supportive Conditions- Structure

	Strongly Disagree	Disagree	Agree	Strongly Agree
Time is provided to facilitate collaborative work.				
The school schedule promotes collective learning and shared practice.				
Fiscal resources are available for professional development.				
Appropriate technology and instructional materials are available to staff.				
Resource people provide expertise and support for continuous learning.				
The school facility is clean, attractive and inviting.				
The proximity of grade level and department personnel allows for ease in collaborating with colleagues.				
Communication systems promote a flow of information among staff members.				
Communication systems promote a flow of information across the entire school community (including: central office personnel, parents, and community members).				
Data are organized and made available to provide easy access to staff members.				

Thank you for the time you took to complete this survey.

Appendix 6

Stages of Concern Questionnaire (SoCQ)

Stages of Concern Questionnaire

#_____

The purpose of this questionnaire is to determine what people who are using or thinking about using various programs are concerned about at various times during the adoption process.

The items were developed from typical responses of school and college teachers who ranged from no knowledge at all about various programs to many years' experience using them. Therefore, **many of the items on this questionnaire may appear to be of little relevance or irrelevant to you at this time.** For the completely irrelevant items, please circle "0" on the scale. Other items will represent those concerns you do have, in varying degrees of intensity, and should be marked higher on the scale.

For example:

This statement is very true of me at this time.	0	1	2	3	4	5	6	7
This statement is somewhat true of me now.	0	1	2	3	4	5	6	7
This statement is not at all true of me at this time.	0	1	2	3	4	5	6	7
This statement seems irrelevant to me.	0	1	2	3	4	5	6	7

Please respond to the items in terms of **your present concerns,** or how you feel about your involve- ment with **this** innovation. We do not hold to any one definition of the innovation so please think of it in terms of your own perception of what it involves. Phrases such as "this approach" and "the new system" all refer to the same innovation. Remember to respond to each item in terms of your present concerns about your involvement or potential involvement with the innovation.

Thank you for taking time to complete this task.

Ft. Rucker Primary School
Professional Development Aug. 26, 2013
The innovation we are concerned with is the Common Formative Retell Assessment and the Differentiated Instruction Plan we are implementing school-wide in support of Continuous School Improvement Goal #2.

SoCQ 075

0 Irrelevant | 1 2 Not true of me now | 3 4 5 Somewhat true of me now | 6 7 Very true of me now

Circle One Number For Each Item

1. I am concerned about students' attitudes toward the innovation.	0 1 2 3 4 5 6 7
2. I now know of some other approaches that might work better.	0 1 2 3 4 5 6 7
3. I am more concerned about another innovation.	0 1 2 3 4 5 6 7
4. I am concerned about not having enough time to organize myself each day.	0 1 2 3 4 5 6 7
5. I would like to help other faculty in their use of the innovation.	0 1 2 3 4 5 6 7
6. I have a very limited knowledge of the innovation.	0 1 2 3 4 5 6 7
7. I would like to know the effect of reorganization on my professional status.	0 1 2 3 4 5 6 7
8. I am concerned about conflict between my interests and my responsibilities.	0 1 2 3 4 5 6 7
9. I am concerned about revising my use of the innovation.	0 1 2 3 4 5 6 7
10. I would like to develop working relationships with both our faculty and outside faculty using this innovation.	0 1 2 3 4 5 6 7
11. I am concerned about how the innovation affects students.	0 1 2 3 4 5 6 7
12. I am not concerned about the innovation at this time.	0 1 2 3 4 5 6 7
13. I would like to know who will make the decisions in the new system.	0 1 2 3 4 5 6 7
14. I would like to discuss the possibility of using the innovation.	0 1 2 3 4 5 6 7
15. I would like to know what resources are available if we decide to adopt the innovation	0 1 2 3 4 5 6 7

16. I am concerned about my inability to manage all that the innovation requires.	0 1 2 3 4 5 6 7
17. I would like to know how my teaching or administration is supposed to change.	0 1 2 3 4 5 6 7
18. I would like to familiarize other departments or persons with the progress of this new approach.	0 1 2 3 4 5 6 7

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0 Irrelevant — 1 2 Not true of me now — 3 4 5 Somewhat true of me now — 6 7 Very true of me now

Circle One Number For Each Item

19. I am concerned about evaluating my impact on students.	0 1 2 3 4 5 6 7
20. I would like to revise the innovation's approach.	0 1 2 3 4 5 6 7
21. I am preoccupied with things other than the innovation.	0 1 2 3 4 5 6 7
22. I would like to modify our use of the innovation based on the experiences of our students.	0 1 2 3 4 5 6 7
23. I spend little time thinking about the innovation.	0 1 2 3 4 5 6 7
24. I would like to excite my students about their part in this approach.	0 1 2 3 4 5 6 7
25. I am concerned about time spent working with nonacademic problems related to the innovation.	0 1 2 3 4 5 6 7
26. I would like to know what the use of the innovation will require in the immediate future.	0 1 2 3 4 5 6 7
27. I would like to coordinate my efforts with others to maximize the innovation's effects.	0 1 2 3 4 5 6 7
28. I would like to have more information on time and energy commitments required by the innovation.	0 1 2 3 4 5 6 7
29. I would like to know what other faculty are doing in this area.	0 1 2 3 4 5 6 7
30. Currently, other priorities prevent me from focusing my attention on the innovation.	0 1 2 3 4 5 6 7
31. I would like to determine how to supplement, enhance, or replace the innovation.	0 1 2 3 4 5 6 7
32. I would like to use feedback from students to change the program.	0 1 2 3 4 5 6 7

33. I would like to know how my role will change when I am using the innovation.	0 1 2 3 4 5 6 7
34. Coordination of tasks and people is taking too much of my time.	0 1 2 3 4 5 6 7
35. I would like to know how the innovation is better than what we have now.	0 1 2 3 4 5 6 7

Concerns Based Systems International Southwest Educational Development Laboratory

Concerns Based Systems International
Southwest Educational Development Laboratory