UNF
UNIVERSITY *of*
NORTH FLORIDA.

UNF Digital Commons

UNF Graduate Theses and Dissertations

Student Scholarship

2016

Secondary-School Department Chairpersons' Perceptions of Pedagogical Content Knowledge

Jonathan K. Greene
University of North Florida

UNF
UNIVERSITY *of*
NORTH FLORIDA.

Secondary-School Department Chairpersons' Perceptions of Pedagogical Content Knowledge

by

Jonathan Keith Greene

A Dissertation submitted to the Department of Leadership, School Counseling, and Sport

Management

in partial fulfillment of the requirements for the degree of

Doctor of Education

UNIVERSITY OF NORTH FLORIDA

COLLEGE OF EDUCATION AND HUMAN SERVICES

December, 2016

ACKNOWLEDGMENTS

Many individuals have sacrificed and assisted in my success while I completed this program. I would like to send my special thanks to those people who helped me through this process over the past eight years.

I first must give thanks to the wonderful committee that assisted and shepherded me through writing the dissertation. I would like to thank my initial committee, comprised of Dr. Sandra Gupton, Dr. Charles Closmann, and Dr. Madalina Tanase, for their cogent suggestions and useful resources offered that significantly helped me complete the dissertation. I would also like to thank Dr. Christopher Janson and Dr. Anne Swanson who joined the committee later in the dissertation for their careful reading and guidance. You each certainly made this process smooth and comfortable.

A special thanks and appreciation must go to my dissertation chair, Dr. Elinor Scheirer. Dr. Scheirer worked tirelessly to ensure that the dissertation was more than to just simply "finish", but rather the development of something that contributed to the field of education and contributed to my overall personal scholarship. Dr. Scheirer and I spent countless hours reading and rewriting in the effort to produce a sound and worthwhile dissertation that we could both be proud to have completed. I know that the skills and knowledge that Dr. Scheirer taught me will significantly assist me throughout my career. I was also fortunate to be with a chair that held a vast amount of experience, knowledge, and brilliance. Though Dr. Scheirer retired from the college prior to my completion of the dissertation, she never wavered, even though she drew no monetary compensation, in order to see me to the end. The display of "staying the course" that

Dr. Scheirer showed was certainly an inspiration to me. I also appreciated our "non-dissertation" conversations where she taught me so much on how to see the world with a more critical eye. Once again, thank you to Dr. Scheirer for all she did on my behalf.

I must also thank some of my supervisors at school who helped me along this process. First, I would like to thank Dr. Jeanne Ballentine. Dr. Ballentine was my principal when I started this program and she encouraged me all the way through that I could do it. I would also like to thank Dr. Arvin Johnson who was my Vice Principal and a graduate of this same program. His advice was critical to me in my first few years of the program. I would finally like to thank my current principal, Ms. Debra Lynch, who encouraged me through the completion of this process and accommodated me on anything that I asked while I finished the dissertation.

I must also extend my acknowledgments to the participants in the study, because without them, I could not have completed this dissertation. Also, the time the participants spent offering their thoughts on the study were highly appreciated and valued.

Finally, and most important, I have to thank my family. As much as I sacrificed in time, money, and energy, please know that I am aware that my family also sacrificed considerably for me to succeed in this doctoral work. To my parents, Keith and Ramona Greene, thank you for watching the kids when I had to be in school and Leeanne was working. You constantly encouraged me and gave me your love as you always have. The support you have given to me throughout my life has been incredible and without that, I would never have thought about earning a doctoral degree. I have to thank my children, Chase and Ashlynn. Both of you were born while I was in the doctoral program so you have always known Daddy as "the student", but it is finally over. I want you both to know how much you each encouraged me and that I am

continually drawing inspiration from both of you. Ultimately, I must thank my wife, Leeanne, who helped me through this process from start to finish. You gave me encouragement when I was down and you celebrated with me when things went well. Thank you for being such a wonderful person who, without complaint, parented alone while I worked on my dissertation. I could have never finished this program without your willingness to help me at every turn. You certainly gave me strength and please know that as proud as you may be for me in this accomplishment know there is no measure to how proud I am to be married to such a terrific wife and mother. I love you so very much.

TABLE OF CONTENTS

LIST OF FIGURES

ABSTRACT

The concept of pedagogical content knowledge (PCK) provides a framework for understanding the professional demands of secondary-school teachers in facilitating student learning. Teachers develop their PCK both formally in preservice and inservice education and informally with their colleagues. Teacher leaders, such as the secondary-school department chairs, can work with colleagues to promote professional growth. The purpose of this study was to understand how secondary-school department chairs understood PCK and perceived their role in promoting the PCK growth of their department colleagues. A qualitative research design using in-depth, semi-structured interviews involved 15 participants from one school district in the southeast of the U.S. Data analysis used Eisner's (1998) four-part approach to criticism—description, interpretation, evaluation, and thematics—as the overall framework, with Hatch's (2002) typological analysis facilitating the description and interpretation phases. The two dimensions of description and interpretation occurred simultaneously, with six typologies organizing the discussion; how participants understood and defined PCK; knowledge of context within PCK; participants' understanding of the importance of content knowledge; growth of the teacher; development of PCK in professional learning communities; and department chair leadership in developing PCK. The evaluation dimension revealed that these chairs did indeed work with their colleagues in developing PCK that, in turn, facilitated student learning. Three major themes based on the data were developed: experienced teachers in leadership positions possess key elements of PCK; department chairs can lead as teachers; and teacher leaders bring

their tacit PCK into the explicit. Implications for leadership include the need for district and

school-based administrators to support the role that department chairpersons play in the

professional growth of their colleagues, to provide developmental opportunities for teachers

designed to focus on PCK and how PCK furthers student learning and to take advantage of the

leadership offered by department chairs in promoting teachers' professional growth. Further

study might examine how department chairs work directly with their colleagues to develop PCK,

how such development of PCK operates in contexts with different demographics than those of

the present study, and how department chairs at different points in their careers assist their

colleagues in their PCK growth.

Chapter 1: INTRODUCTION

For decades, secondary-school teachers have struggled regarding how they should best teach course content in order to develop student understanding and achievement (Darling-Hammond, 1999). The secondary-school curriculum includes content courses that rely almost exclusively on content from specified disciplines of knowledge, such as mathematics, science, social studies, and the language arts. Despite this clear focus on disciplinary knowledge, teachers need both content knowledge in the discipline and pedagogical knowledge regarding how to teach it in order for students to meet curricular goals. If teachers possess only one of these types of knowledge, they may fail in fostering student learning. Therefore, both pedagogical and content knowledge are necessary if teachers are to have the highest likelihood of helping students learn (Shulman, 1986).

The task teachers have before them is daunting. Having a deep understanding of the content is not enough without the proper methodology and strategies available to facilitate student learning. A content expert with limited pedagogical knowledge may not know the pedagogical strategies necessary to help secondary students understand content.   Pedagogical skills such as developing lesson plans to engage students or the ability to foresee misconceptions within a discipline and account for these misconceptions may elude teachers who primarily possess content knowledge. Similarly, a teacher who has substantial comprehension pedagogy yet holds limited knowledge of content may have difficulty in promoting students' understanding of challenging content. For example, though a teacher may know successful teaching strategies,

the lack of content knowledge may hinder the teacher's ability to determine which strategy is best suited for a specific topic within the content area and what content misconceptions may exist which require specific pedagogical strategies. Therefore, successful teachers must both understand the content deeply and be able to effectively share that knowledge and develop it so that their students will learn. When teachers are in possession of both content knowledge and the pedagogical knowledge relevant to that content, they possess what Shulman (1986) termed Pedagogical Content Knowledge (PCK).

In order for teachers to combine the intersection of pedagogy and content knowledge, they first must be able to understand the structure of their disciplines. Schwab (1969) introduced the notion of the need for teachers to understand the structure of knowledge within a particular discipline. Schwab posited that teachers needed specialized types of knowledge and understanding in order to teach content material effectively. Using the discipline of science, Schwab stated that a teacher who teaches biology must develop a different type of knowledge and think differently in contrast to a teacher who teaches physics. This conceptual understanding of a field assists a teacher in comprehending the knowledge that is needed in order to teach a specific discipline (Ball, Thames, & Phelps, 2008; Berliner, 1991). Teachers with the understanding of the structure of a discipline can begin to use thoughtful, strategic approaches specifically designed for the specific content they are teaching.

Building on Schwab's (1969) concept of the structure of a given discipline is the concept of Pedagogical Content Knowledge (PCK) proposed by Shulman (1986). The concept of PCK refers to teachers' knowledge of how to connect deep understanding of content with pedagogy in order to help students comprehend the subject matter. PCK also refers to a teacher's

understanding of a content area in the curriculum that also recognizes the structure of that content area. For example, teachers need to understand how the structure of a discipline could influence both vertical and horizontal curricula (Shulman, 1987). Knowledge of the vertical curriculum means that a teacher understands what students have already learned in the discipline and will subsequently learn within a discipline, while knowledge of the horizontal curriculum refers to a teacher's awareness of what students are concurrently learning across all disciplines.

However, PCK is more than teachers understanding the curricula horizontally and vertically; rather, teachers' PCK involves understanding the complexities in the structure of a discipline and the implications those have for student learning. This development of teachers' PCK is a long and complex process that can lead to expertise in the field (Berliner, 1991). It is a career-long process, requiring development from the time teachers enter preservice education courses throughout their professional careers (Bullough, 2001).

Researchers have promoted PCK as a necessary form of knowledge that teachers must possess in order to teach effectively (Ball et al., 2008; Barrett & Green, 2009; Frykholm & Glasson, 2005). They have argued for the development of PCK in preservice education (Bullough, 2001; Dawkins, Dickerson, McKinney & Butler, 2008; Westhoff & Polman, 2008). Others have described how PCK can be fostered in professional development initiatives (Bullough, 2001). Research has also documented how teachers learn from each other to promote PCK (Camburn, 2009).

Initially, most teachers are exposed to the complex notion of PCK in their preservice education. Many teacher-preparation courses and programs aim to develop the PCK of their preservice teachers through coursework and on-site field experiences (Boz & Boz, 2008;

Doppen, 2007). Secondary preservice teachers take courses that specifically develop content knowledge, courses that specifically focus on developing general pedagogical methodology, and courses that expose preservice teachers to teaching methodology within a specific discipline. Preservice teachers may also be exposed to curriculum development processes (Kahne & Westheimer, 2000). Preservice teachers must understand how they interpret and implement subject matter for their students, as well as begin to understand the vertical and horizontal curricula (Kahne & Westheimer). Therefore, PCK assists in the processes of curricular understanding, which are the resources useful in teaching the specific content, along with the beginnings of knowing what parts of the content may be misunderstood by students (Shulman, 1986, 1987).

Though teachers are introduced to PCK in their preservice education programs, upon entering the profession they need to continue building on the development of that knowledge. Opportunity for professional development occurs when teachers first enter the profession and work with each other on a one-on-one basis. Formally assigned mentors may also assist teachers entering the profession in their transition from preservice to full-time professional.

Throughout a teacher's career, professional development opportunities contribute to growth in PCK. Teachers participate in formal and informal professional development opportunities and, in addition, work alongside veteran teachers in order to enhance their PCK. Through this combined effort of professional development and peer assistance, teachers begin to significantly build upon their understandings of what it means to be a successful educator (Conway, 2008).

The professional development opportunities in which teachers participate are varied.

Indeed, professional development opportunities can make a considerable contribution toward teachers' growth in their PCK (Bullough, 2001). These opportunities can be as informal as reading a book or article based on the discipline that is being taught or be as formal as enrolling in a graduate level program at a university. Even at the district level, teachers can participate in workshops that offer either content knowledge or pedagogical knowledge and, in some cases, in professional development that offers both. Also, teachers can become involved in developing curriculum either at the school level or at the district level; such involvement in curriculum development can expand their PCK (Coenders, Terlouw, Dijkstra, & Pieters, 2010; Patel, Franco, Miura, & Boyd, 2010).

One example of a professional development environment where teachers help expand each other's PCK is the professional learning community (PLC; Leiberman & Lynne, 2011; Penuel, Fishman, Yamaguchi, & Gallagher, 2007). PLCs bring teachers together to discuss the content curriculum, to discuss student work, and to determine common misconceptions within a content area (DuFour, 2004). Through collaboration and discussion, teachers enhance their understanding of how to help their students learn content. Furthermore, because PLCs are teacher-led and teacher-directed, they are also environments where teacher leadership is developed. For example, a teacher within a PLC may take the lead in guiding fellow teachers regarding a particular aspect of the PLCs agenda. Teachers might offer particular expertise in specific content areas and specific teaching methods. Thus, leadership within a PLC is fluid, with all teachers participating in the leadership tasks within a given PLC and thereby enhancing one another's PCK (Penuel et al.).

In addition, teachers help other teachers when they informally discuss with each other the challenges of teaching and learning. For example, teachers may informally discuss with each other student-produced work as a springboard to examine the challenges of helping particular students learn. Also, teachers may discuss with their colleagues the successes of student learning within their classes. These instances are examples of teachers assisting each other in developing PCK.

These efforts in supporting colleagues are examples of teacher leadership. When teachers work together to develop their understanding of teaching and learning, significant benefits can take place for all involved. Teacher leaders who can also assist their colleagues in furthering their understanding of PCK are department chairpersons of specific content disciplines. In addition to participation as members of PLCs where they contribute expertise in those environments when appropriate, department chairpersons may be seen as teacher leaders by their colleagues because of their official designation as department chairpersons (Kelley & Salisbury, 2013). Thus, in addition to their teaching roles and administrative duties, department chairpersons can help further the PCK growth of teachers within their departments (Feeney, 2009). Indeed, the role of department chairperson may occasion a more specific leadership role focusing on teaching and learning.

Statement of Problem

Pedagogical Content Knowledge is an important component in how teachers help their students learn. PCK is the fundamental blending of content and pedagogy in order to foster learning among students. In 1986, Shulman called for researchers to describe PCK in action and to investigate how to foster its development among teachers. Researchers have responded to

Shulman's call and have extended the profession's understanding of PCK through formal preservice teacher education and professional development (Ball et al., 2008; Barrett & Green, 2009; Frykholm & Glasson, 2005). However, understanding how teachers learn from each other and from teacher leaders can also contribute to fostering PCK growth among professionals.

Teacher leadership is a way for teachers to influence their colleagues in order to improve teaching practices and increase student learning and achievement (York-Barr & Duke, 2004). Teacher leaders can serve in many roles, either informal or formal. Informally, teacher leadership can develop when a teacher assists a colleague in understanding teaching methodology or content material. These informal leaders do not need an official title or role, but rather develop as a contributor within a PLC or simply as teachers who assist their colleagues. However, more recognizable in assisting teachers are teacher leaders who hold official titles and roles that are formally dedicated to leadership. These teacher leaders can hold titles such as mentors and department chairpersons. Although mentors serve in helping novice educators with the transition from preservice teaching into the teaching profession (Ediger, 2011), they usually have only one or two mentees within a school year. In contrast, department chairpersons are teacher leaders who can affect many teachers' growth in PCK because they lead an entire academic department.

The department chairperson is both teacher and leader. Department chairpersons are selected by the administration with the understanding that they will manage and lead their departments. Department chairpersons must relay information from administrators and bring back information to the administrators from their departments. In addition, department chairpersons act as leaders in curricular decisions within their departments (Wettersten, 1992).

Therefore, through such leadership with their colleagues, department chairpersons have the opportunity to promote the growth of PCK among their colleagues. The present study sought to understand how department chairpersons perceived their own understanding of PCK and their efforts in promoting PCK with their colleagues.

The theoretical framework guiding the study included:

- Teachers who have pedagogical content knowledge contribute to student learning;

- Teachers can be leaders in their schools;

- Department chairpersons are one type of teacher leader;

- Teacher leaders can contribute to colleagues' professional growth;

- Teacher leaders can contribute to colleagues' professional growth in PCK; and

- Development of PCK results from both the individual professional efforts of teachers and their interactions with colleagues, both informally and formally.

Research Question

Given the theoretical framework described above, the purpose of this study was to understand how department chairpersons perceived PCK and how they perceived their efforts to promote PCK among their colleagues. Research on the role of department chairpersons has focused primarily on management and general leadership (Feeney, 2009; Zepeda & Kuskamp, 2007). Less is known about their role in fostering the instructional growth of their colleagues. Department chairpersons possess titular leadership in that they have a title, but few have supervisory authority. The role of the department chairperson can be seen as a teacher leader who may, for example, serve as a focal point for any questions from their colleagues concerning teaching methods and content knowledge. Because the work in developing PCK is complex, one

way to understand how this complex process takes place is to ask those involved how they see the process. One way of learning more about how departmental chairpersons view their role in fostering teachers' development of PCK is to ask the department chairpersons about their understanding of their role in developing PCK with their colleagues and within their departments.

The present study focused on department chairpersons as participants because of their role as teacher leaders who are in a position to work with colleagues from within their department on a regular basis. As teacher leaders, they work with colleagues from their specific disciplinary department. In addition, their teaching experience provides them with understanding of pedagogy and methodology for their specific content area. Many teachers see their department chairpersons as colleagues who promote school improvement and offer new ideas within the department (Kelley & Salisbury, 2013). Also, studies and articles have concluded that not only do teacher leaders assist teachers in the growth of their PCK, but department chairpersons, specifically, assist their teacher colleagues (Feeney, 2009; Kelley & Salisbury; Zepeda & Kuskamp, 2007).

In order to understand how department chairpersons perceive their own role in assisting their colleagues' development of PCK, this study investigated the following question: How do department chairpersons understand PCK and perceive their role in promoting the PCK growth of their colleagues and within their departments? Because the study focused on understanding the complex knowledge held by individuals, in-depth, semi-structured interviews were used to elicit department chairpersons' perspectives (Patton, 2002).

Premises for the Study

Key premises supported this research into how department chairpersons understood PCK and their role in assisting teachers in PCK growth. The first premise was that teachers as colleagues help one another develop PCK. The second premise central to this study was that teacher leaders or teacher leadership develops when teachers work with each other to develop their professional knowledge. The third premise framing this study was that department chairpersons carry a role designation and thus are likely seen as teacher leaders by their colleagues. The final premise was that when teachers are learning, they are focusing on enhancing their PCK. Therefore, the present study focused on the role of department chairpersons as teacher leaders in the development of PCK in order to learn more about their perceptions of PCK and how they see their contributions in fostering other teachers' PCK.

Assumptions Regarding Participants

Several assumptions regarding participant characteristics influenced the design of the present study. The first assumption was that department chairpersons have some understanding of the concept of PCK, though they may not refer to it by that label. This assumption is drawn from the notion that teachers think about how they are going to teach content to their students and what teaching methods may be most successful in particular instances. The second assumption was that department chairs and the teachers with whom they teach have had at least some experience with having pedagogy and content mutually enhance each other in order to develop student learning. This assumption derives from the notion that teachers have taught or have observed another teacher's classroom practice where pedagogy and content enhanced each other. The last assumption was that teachers do engage with each other about pedagogy and

content, both as separate concerns and as the two interact with each other in complex ways. This assumption acknowledged that when teachers participate in departmental faculty meetings, are involved in mentor programs, or are engaged with colleagues informally throughout the work day, they discuss teaching in such a way that recognizes the importance of both content and pedagogy in their practice.

Significance

Teachers' Pedagogical Content Knowledge is important because it is critical in their efforts to facilitate student learning. Understanding how teachers develop their PCK and how teacher leaders promote the growth of their colleagues' PCK can provide knowledge that in turn can contribute to efforts to help students learn. Department chairpersons, as one group of teacher leaders, are positioned well to foster the development of PCK in their departments and also are recognized officially as leaders capable of assuming such responsibility. Though there have been studies conducted on the administrative role of department chairpersons (Zepeda & Kuskamp, 2007), the present study described department chairpersons' role as instructional leaders among their colleagues. Thus, the perceptions department chairpersons hold regarding their role in PCK development can yield insight into how teacher leaders can facilitate PCK growth and how their role as department chairpersons includes such responsibilities. Understanding how department chairpersons promote their colleagues' PCK growth has the potential to help other educators promote and enhance the development of PCK in order to help students learn.

Definition of Terms

The present study employed key terms that are defined below. These definitions provide the reader with an understanding of how key concepts related to its purposes, design, and procedures.

Content Knowledge: the subject matter knowledge that is to be taught.

Curriculum: courses, experiences, and assessments necessary to teach or work with students at a specific age level and/or to teach a specific subject area.

Department Chairperson: a teacher who heads a specific subject area in secondary schools who is either appointed by the school principal or chosen by the faculty.

Horizontal Curriculum: the curriculum of what students learn in a given year throughout the different content disciplines (Shulman, 1987).

Mentor: a veteran teacher who works with and assists a novice teacher, usually during the novice teacher's first year within the profession.

Pedagogical Content Knowledge: the intersection of the subject matter and effective teaching strategies to help students learn the subject matter that includes a thorough understanding of the content in order to teach it in multiple ways, drawing on the cultural backgrounds and prior knowledge and experiences of students (National Council of Accreditation for Teacher Education. 2014).

Pedagogical Knowledge: the general concepts, theories, and research about effective teaching, regardless of content areas (National Council of Accreditation for Teacher Education, 2014).

Professional Development: the process of teachers enhancing their knowledge through district,

     collegiate, in school, and personal study.

Professional Learning Community: a group of teachers who analyze lesson plans, examine

     student work, and discuss effective teaching methods.

Secondary School: a school that provides education for students in grades 6 through 12.

Structure of the Discipline: the way a specific subject area is organized conceptually and

     constructed in order to differentiate the way thinking proceeds in that subject area from

     other subject areas. Such understanding of the structure of the discipline provides

     necessary knowledge for teaching and learning in a given subject area (Schwab, 1969).

Teacher Leader: a teacher who assists other teachers through collaboration and knowledge of the

     teaching profession.

Vertical Curriculum: the curriculum of what students will learn each year in school within a

     specific discipline (Shulman, 1987).

Chapter Summary

In order for teachers to be successful in having their students learn, they must possess Pedagogical Content Knowledge. PCK, the understanding of the interaction of pedagogy and content in order to make the content comprehensible to students, ideally develops throughout a teacher's career. Teachers acquire PCK in formal and informal ways, including learning from other colleagues and teacher leaders. One such leader who is accessible to most teachers is the department chairperson. This study investigated how department chairpersons perceived their own PCK and understood their role in assisting their colleagues in the growth of PCK.

This chapter discussed the need for this study, as well as the premises on which this study was based, in order to lay the foundation for the research question. This chapter also discussed the significance of the study, along with definitions of relevant terms. Chapter 2 contains the review of related literature regarding how PCK is acquired during preservice education, expanded through professional development within the profession, and enhanced by teacher-to-teacher interactions. Chapter 2 also presents the conceptual framework for the study. Chapter 3 includes discussion of the research design, methodology followed in data collection, methodology followed in data analysis, provisions for participant confidentially and protection, and procedures for promoting credibility. Chapter 4 describes the processes followed in data analyses, along with the results of those efforts. Chapter 5 includes summaries of the previous chapters, limitations of the study, implications from the study for educational leadership, and recommendations for further research.

Chapter 2: LITERATURE REVIEW

Pedagogical Content Knowledge or PCK is critical to the effectiveness of teachers helping students understand subject area content (Shulman, 1987). The essence of PCK is the ability for teachers to use relevant, subject matter content in a way that students understand the material. That is, through a process of understanding content and reflection on previously taught or observed lessons, an educator can assist students toward a deeper understanding of the material (Shulman, 1987).

This study aimed to increase understanding of how teacher leaders in secondary schools perceived their role in enhancing PCK within their departments and with their colleagues. Teacher leaders are in a position to assist their colleagues' PCK growth by providing guidance, by offering knowledge within a given curriculum, and by directly assisting their colleagues in the use of teaching methods they have acquired through their own development of PCK.

This review of the literature examines the way educators develop and enhance their own PCK. The review begins with a discussion of the initial concept Shulman (1986; 1987) developed concerning PCK and how researchers have developed this concept (Ball, Thames & Phelps, 2008; Barrett & Green, 2009; Frykholm & Glasson, 2005). The review next examines how teachers initially begin to acquire PCK through college coursework and through professional development. Critical to highlighting how teachers first develop their PCK is examining how PCK is fostered in preservice teacher education. It is equally important to review the literature concerning how teachers enhance their PCK through professional

development opportunities within their professional environments. The review concludes with a discussion of the roles and responsibilities of teacher leaders within secondary schools, along with how they can facilitate the growth of PCK within their professional environments.

The Concept of Pedagogical Content Knowledge

The concept of Pedagogical Content Knowledge (PCK) includes the understanding of specific content knowledge that allows for content to be taught in a way that is intelligible and effective (Shulman, 1987). Lee S. Shulman coined the phrase Pedagogical Content Knowledge and defined it as:

> the distinctive bodies of knowledge for teaching. It represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organized, represented, and adapted to the diverse interests and abilities of learners, and presented for instruction. (p. 8)

Shulman argued that PCK is evident when a teacher has full understanding of the subject matter and how best to "make it comprehensible to others" (Shulman, 1986, p. 9).

In his description of a teacher's PCK, Shulman (1986) identified several components within what he called pedagogical reasoning. The components of pedagogical reasoning interact as a cycle. Within this cycle, Shulman identified six core components that described the processes through which a teacher proceeds when preparing for teaching a concept effectively: Comprehension, Transformation, Instruction, Evaluation, Reflection, and New Comprehensions (Shulman, 1987).

Through each cycle the teacher develops increasingly complex understanding of the content and of the pedagogical challenges accompanying the content (Shulman, 1987).

Comprehension refers to the subject matter structures and ideas found in and outside of the discipline. Transformation includes four subcategories which are preparation, representation, selection, and adaptation of the material by the teacher in order to make the content easier for students to understand. The Instruction part of the cycle deals with how the subject matter is actually taught to the students. Within the Instruction component of pedagogical reasoning, material is taught through methods best suited to communicate the content to students. Instruction can be represented in such ways as presentation of the material to students, interactions between student and teacher, group work among students, and the type of questioning used by the teacher. Evaluation, the fourth step of the cycle, entails checking for student understanding using assessment that can be both formal and informal. Reflection occurs when the teacher critically analyzes her or his own performance and uses evidence of effectiveness from the evaluation component to determine if the teaching objectives were met. Finally, in the New Comprehension component, a teacher gains new understandings of the content from the actual experience of teaching that content.

Having gained new understanding, a teacher can use this knowledge to inform the next pedagogical reasoning cycle (Shulman, 1987). More specifically the teacher can use the new comprehensions to guide future efforts at teaching the content. Shulman, however, argued that this cycle did not need to be followed in his described order. He also noted that during the teaching process, some aspects of the cycle may be extended or shortened, but all teachers would benefit from understanding and using this model.

Following Shulman's articles in 1986 and 1987, many articles and studies expand the PCK concept within the field of education (Ball et al., 2008; Barrett & Green, 2009; Frykholm &

Glasson 2005). Concepts that developed from Shulman's writings on PCK include Specialized

Content Knowledge and Pedagogical Context Knowledge. Each of these concepts integrated and

expanded on Shulman's work dealing with PCK.

Ball et al., (2008) argued that PCK was actually a category that could be placed inside a

larger context they called Specialized Content Knowledge that also included a category labeled

Subject Matter Knowledge. They argued that their model of Specialized Content Knowledge,

with PCK and Subject Matter Knowledge as subsets, provided a framework for research. Within

each of these two strands, the authors defined subcategories that better explained the type of

knowledge that should be present within the larger context of Specialized Content Knowledge.

Inside the Subject Matter Knowledge strand the two subcategories described are

Common Content Knowledge and Horizon Knowledge. Common Content Knowledge refers to

knowledge of an academic discipline, while Horizon Knowledge refers to understanding how a

discipline is related to the curriculum as a whole. Horizon Knowledge can also be referred to

what Shulman (1987) described as a teacher understanding what content within the discipline is

taught at other levels or within the vertical curriculum. For example, a third-grade science

teacher understands what is taught to students within the fourth-grade science curriculum and

what is taught in the second-grade science curriculum. Within the Specialized Content

Knowledge framework, Ball et al. (2008) outlined three subcategories. These subcategories were

Knowledge of Content and Teaching or how to teach specific disciplines, Knowledge of Content

and Students or how to address certain misunderstandings and problematic understandings

students may have with the content, and Knowledge of Content and Curriculum or how the

subject matter fits into the overall curriculum. Ball et al. described how these subcategories of

Specialized Content Knowledge could allow researchers to look at PCK in a way that facilitates empirical research. The results from this research could describe the possible impact of PCK on teaching and learning.

A second expansion of Pedagogical Content Knowledge (PCK) was Pedagogical Context Knowledge. In a qualitative study that attempted to clarify and reexamine Shulman's (1987) work concerning preservice secondary mathematics and science teachers, Frykholm and Glasson (2005) discussed PCK being part of what they called Pedagogical Context Knowledge. Pedagogical Context Knowledge contained all the aspects of PCK and also added professional knowledge and classroom knowledge. As indicated, the study involved classroom knowledge which was a situational understanding that pertained to each subject, classroom, and school. The researchers also defined professional knowledge which could be described as teacher "lore," which is information and knowledge generally passed down from seasoned practitioners to novice teachers.   The study described effective planning within learning communities among science and mathematics preservice teachers as they developed cross-curricular classroom lessons placing the content material into a situational context. Using interviews, observations, and self-report data, the researchers found that the math and science student-teacher participants became more knowledgeable regarding the integration of science concepts within math units and math concepts within science units. The participants found that integrating both math and science content within their lessons enabled them to better assist their students in understanding the specific concept being taught and allowed for more connections to be made concerning the content. The study emphasized that PCK began to develop during college coursework and

within teacher education programs due to understandings developed with curriculum and lesson design.

Barrett and Green (2009) offered another view with PCK divided into three domains. The first and second domains were content knowledge and pedagogical knowledge, similar to what Shulman (1987) described. However, the third domain, context knowledge, refers to teachers understanding their learners as the latter engage with the content. That is, the Barrett and Green model reflects Schwab's (1969) assertion that teachers' understandings of a content area's structure are critical in making sure that students understand what is being taught. This model also reflects the definition of PCK used by the National Council for Accreditation of Teacher Education (2013)—that PCK is an interaction of effective teaching strategies, content, and an understanding of the cultural backgrounds and knowledge that students possess.

Barrett and Green (2009) also indicated that enhancing PCK is a reflective process, much as Shulman (1987) noted in his pedagogical reasoning cycle that included reflection as a key component for enhancing PCK. Reflection on teaching methods, content, and students allows teachers to extend their PCK; however, teachers could begin to acquire these skills in their preservice education. The next section of the review of the literature examines how teachers and students acquire PCK in preservice education.

Preservice Education of Teachers

Foundations for developing Pedagogical Content Knowledge or PCK are embedded within teacher-preparation courses offered by colleges of education. Researchers have called on colleagues of education to help strengthen preservice educators' PCK (Bullough, 2001; Dawkins, Dickerson, McKinney & Butler, 2008; Westhoff & Polman, 2008). Teacher preparation courses

and programs are intended to give teachers the technical skills and foundational knowledge for becoming proficient educators. Many preservice teacher-education programs develop their students' PCK through coursework and on-site field experiences (Boz & Boz 2008; Doppen, 2007).

Initially, much of the early efforts to develop preservice teachers' PCK have taken place within math education and science education (Schwab, 1969; Geddis, 1993; Even, 1993; Graham & Fennell, 2001). Even (1993) conducted a study that indicated that preservice teachers held an antiquated view of teaching the function concept in mathematics. Qualitative data gathered through interviews and surveys indicated that, without better content knowledge, preservice teachers would not be successful in teaching the function concept effectively. She recommended that teacher education programs focus directly on how to teach the function concept. Greater understanding of the function concept by preservice teachers at the collegiate level would enable them to teach the function concept to high-school students more effectively. In 2008, Piccolo echoed Even's findings by stating that mathematics must be understood at a deep level in order for a teacher to bring needed content knowledge to the complexities of classroom instruction.

Although Piccolo (2008) and Even (1993) underscored the importance of deep understanding of content, understanding of content alone is not enough for a teacher to become successful in instructing students. Preservice teachers must have experience in how to interpret, develop, and implement subject-matter curriculum (Kahne & Westheimer, 2000). Experiences with the process of transforming content for pedagogical purposes, from conception to planning to implementation, and reflection on these experiences serve as a powerful learning tool for college of education students (Manouchehri, 1997). This process provides preservice educators

with knowledge that can enhance their abilities and understandings of the content they are teaching. Once preservice educators have completed the process of developing and implementing self-created curriculum, they can then reflect on the curricular development process thereby increasing their PCK (Kahne & Westheimer). This process reflects Shulman's (1986 & 1987) call for curricular understanding in a teacher's development of PCK within his Pedagogical Reasoning model. For example, through understanding the curriculum, a teacher better understands which texts to use, what films he or she may show, and other materials that can expand upon subject matter to enhance students' understanding.

However, Kahne and Westheimer (2000) did not include in their model the need for preservice teachers to understand how the mathematics curriculum related to other subject areas. Shulman (1986) described the need for teachers to understand the curriculum outside of the particular course they are teaching by learning about the horizontal and vertical curricula. Ball et al. (2008) also indicated the importance of understanding the horizontal curriculum and vertical curricula in the Common Content Knowledge subcategory of their Specialized Content Knowledge model. Understanding the horizontal curriculum refers to a teacher's need to consider the other courses which students take concurrently. A teacher's understanding of the horizontal curriculum promotes cross-curricular student learning. Understanding the vertical curriculum enables teachers to build upon previously taught knowledge or provide needed background knowledge for courses students will take in the future. Shulman stated that teachers who know the vertical and horizontal curricula of their students can align content and use student background knowledge to improve student understanding. Colleges of education should

establish the basic concepts of the vertical curriculum and the horizontal curriculum that could then become more fully developed in later teaching practice.

Although understanding both the vertical and the horizontal curricula is important for preservice educators, teacher education programs need to engage their students in hands-on activities in order to be most effective. Hands-on activities are used to help provide much needed practice and can assist in the development of PCK (Lowery, 2002). Lowery's study focused on elementary student teachers who had limited math and science knowledge and were teaching math and science labs. The hands-on approach in the labs gave the preservice teachers more in-depth knowledge of the math and science content and allowed them opportunities to reflect upon the lessons they taught. Lowery indicated that the participants developed more confidence and understanding of how to teach math and science content. Assessment through data gathered from individual interviews, focus group interviews, weekly evaluations, reflective journals, field notes, and preservice teacher portfolios indicated that preservice educators' PCK developed through guided hands-on instruction and opportunities for reflection.

PCK is not only developed by preservice teachers working hands-on with students, but it may also be enhanced through specific college coursework. For example, Huntley and Flores (2010) suggested that future math teachers needed to be taught about the history of mathematics. Better teaching can occur when more knowledge within a content field is thoroughly understood by an educator (Even, 1993; Graeber, 1999; Piccolo, 2008; Shulman, 1986). This knowledge of how mathematics has influenced history could dramatically assist teachers in sharing with students the importance of mathematics within their lives, as well as encourage their students to make real world connections to the content knowledge that reflects attention to both the vertical

and horizontal curricula. Making connections of the subject-matter to real world concepts gives teachers the opportunity to think thoughtfully and critically about lesson development and how to adapt subject-matter instruction that will reach their students in more concrete and significant ways. This type of learning allows teachers to communicate the "Big Ideas" (Greenes, 2009) of mathematics so their students can understand the connection among the various mathematical disciplines such as geometry, algebra, and statistics. Teachers who learn the history of their discipline, especially in mathematics, can gain understanding of how mathematics is connected through the various sub-disciplines and can enable them to enhance their instruction by knowing what mathematical concepts their students have learned and what mathematical concepts will be needed in their students' future mathematics courses. In addition, this type of knowledge could lead teachers to include social issues in their teaching of mathematics (Gutstein, 2003).

An example of the literature that combines prior college coursework and the role of hands-on learning for preservice teachers is Doppen's case study (2007) of student-centered learning in a social studies teacher-education classroom comprised of a cohort of preservice teachers. Doppen identified the notion that many preservice teachers initially believed that social studies content should be delivered through a direct, lecture-only process. This case study analyzed preservice teachers' understandings on how to effectively teach social studies through the use of data gathered while the participants were involved in a field experience teaching in an actual classroom. Doppen collected data through questionnaires and reflective journal entries regarding how the preservice participants used historical inquiry and student-centered approaches while they taught. The participants reported that they used many of the techniques they had learned in their own coursework that included using student-centered teaching and

historical inquiry. They reported multiple teaching strategies and the use of primary documents within their daily teaching lessons. This case study provided evidence that the knowledge gained through college coursework focusing on historical inquiry and student-centered learning experiences enhanced the preservice teachers' PCK.

Another research study pertaining to three individual case studies involved an afterschool history project with high school students (Westhoff & Polman, 2008). Here preservice teachers with previous coursework in teaching history were better able to connect subject material with the students than the preservice teachers who were not as knowledgeable in the field of history. The preservice teachers who had a well-developed PCK were majoring in history; however, the preservice educator who was least successful in the afterschool history project was majoring in political science. The researchers suggested that that participant was least successful because he had the least amount of content knowledge and pedagogical knowledge in teaching history. Westoff and Polman concluded that preservice teachers who had a greater understanding of their subject matter and the use of historical inquiry methods from prior coursework were better able to effectively engage their students with the content. Similar to Doppen's (2007) work, these preservice teachers benefitted from coursework designed to develop their pedagogy within their particular field.

Preservice teachers can also enhance their PCK when they work with preservice educators from different disciplines in order to develop cross-curricular learning experiences. For example, preservice teachers collaborated across the fields of math and science in order to develop and implement curriculum that connected both of these fields (Frykholm & Glasson, 2005). The researchers conducted a two-year study with preservice teachers who were both

graduate and undergraduate students. The study consisted of two separate cohorts who were enrolled in pedagogy courses in their specific disciplines. The participants within this study self-reported that they were leery of pulling in content from a field that was not one they had studied. The participants also indicated that they had never experienced learning that included content from both math and science. This lack of experience as students indicated that they had no real-world connection to the cross-curricular practice.

Using data such as focus group interviews, individual interviews, questionnaires, and observations of the participants developing and implementing lesson plans, Frykholm and Glasson (2005) found that the collaborative efforts of the math and science preservice teacher participants connected knowledge from the two fields of math and science. Connecting knowledge occurred when the participants included math concepts in science lessons and science concepts in math lessons. As the study continued, teachers began to use their new understandings of the connections between math and science to teach specific aspects of both disciplines simultaneously. By connecting disciplinary knowledge, the participants were able to enhance their PCK through the development of learning experiences fostered student understanding of content. In doing so, these preservice teachers extended their knowledge of the horizontal curriculum (Shulman, 1987).

Preservice teacher education is vital in helping future teachers develop their PCK. College of education students acquire a foundation for their careers through developing pedagogical approaches, the vertical and horizontal curriculum, learn through participation such as hands-on teaching opportunities, and comprehending content so as to facilitate student learning in their own classes and across the vertical and horizontal curricula. Teacher education

programs also encourage preservice teachers to reflect on what they have learned and how they will use course material in their future profession (Manouchehri, 1997). To build upon lessons learned while in preservice teacher education courses and experiences in the teaching field, teachers should continue perfecting their craft on-the-job. This type of learning can occur, for example, through professional development opportunities that can include the enhancement of PCK.

Professional Development

Professional development serves as a cornerstone in the continuing education of teachers. Such professional development can include: graduate courses, in-service workshops, curriculum development opportunities, and various independent pursuits. Effective professional development enables teachers to enhance their teaching practice in order to apply it within their classrooms (Bullough, 2001). The development of teacher's PCK occurs when teachers are granted more direct autonomy and sustained opportunities to demonstrate newly taught skills within their profession (Van Driel & Berry, 2012). In addition, in order to provide teachers with opportunities to enhance their PCK, they must have sustained learning that involves time for reflection on their teaching (Bailey, 2010; Benton & Benton, 2008; Hofstein, Carmeli, & Shore, 2004; Penuel et al., 2007; Van Driel & Berry, 2012).

Graduate-level coursework in teachers' specific discipline that increases their subject-matter knowledge is an effective form of professional development (Dall'Alba & Sandberg, 2006). For example, one study reported on 19 secondary mathematics teachers—all but one who were enrolled in a graduate-level mathematics course—focused on understanding mathematics conceptually (Anderson & Hoffmeister, 2007). The course emphasis included three professional

learning strategies: problem solving, examination of student thinking, and a discussion of current mathematics education research. Using pre- and post-test data, as well as open-ended survey questions, Anderson and Hoffmeister noted there was considerable growth in the teacher participants' conceptual understanding of mathematics. Anderson and Hoffmeister also reported that the teachers' responses did not to yield consensus regarding which professional learning strategy within the course was most influential. However, the researchers were encouraged that the participants stated that, as they learned new material, they were consistently thinking of how this new information could be used in their classrooms. Anderson and Hoffmeister's findings supported the concept that explicit professional development focused on content-rich knowledge for teachers not only increases subject-matter knowledge, but also provides teachers with opportunities to reflect on how these new understandings could be used in their own classrooms. Thus, by reflecting on what they were learning, the teachers were enhancing their PCK (Shulman, 1987; Manouchehri, 1997).

Evaluation studies of effective professional development efforts have indicated how PCK can be enhanced. One professional development program evaluation study focused on a two-week professional development seminar designed to enhance inquiry-based teaching methodology (Rushton, Lotter, & Singer 2011). The seven chemistry teacher participants initially self-reported that their content knowledge was well developed and that they only needed to learn how to incorporate inquiry-based skills during their instruction. During the first week of the seminar, the seven teachers acquired content-based information pertaining to chemistry with instruction from college faculty members. The teachers quickly realized that their content knowledge was not as in-depth as they initially believed. Data from interviews conducted at the

end of the seminar indicated that the teachers all understood they needed more content knowledge in order to fully embrace the inquiry style of teaching. This program evaluation study indicated that teachers who wish to enhance their own PCK must become more knowledgeable within their specific content area, especially when they intend to use new teaching methods. Another aspect of this program evaluation study was that once teachers assumed the role of a student, they were able to begin understanding how their own students learn material, which gave them a new perspective on how to best to teach the content. The participants appreciated the challenges in learning new content which helped them realize how their students would feel when they were exposed to this material. Becoming students enabled the teacher participants to recognize that they needed to be able to anticipate questions from students and to anticipate possible student misunderstandings of content. As Shulman (1987) stated, an important aspect of PCK is the ability to anticipate the misconceptions within subject matter in order to help students understand the content.

Another evaluation study of a professional development program in geology involved secondary teachers (Hemler & Repine, 2006). The professional development project, called GEOTEACH, focused on enhancing teachers' knowledge. The secondary science teacher participants mapped geological information under the guidance of university professors. Both qualitative and quantitative data were used for evaluating this program. Pre- and post-test quantitative data, teacher self-reporting data from journals, and concept maps developed by the participants, indicated that teachers strengthened their understanding of geological content. Analysis of the participant journals indicated that teachers became empowered to develop in-depth lessons that could be used within their classrooms. The program evaluators concluded that

participants in the project demonstrated geological content knowledge equivalent to that of an undergraduate student majoring in geology. The knowledge gained by participants enhanced their specific knowledge in a subject area where they were not expert. This knowledge could be transferred into increased PCK and could be used in the development of learning experiences that reflected teachers' thoughtfulness about content, along with their anticipation of possible student misconceptions (Barrett & Green, 2009).

In the program evaluation studies described above, the researchers found that when participants became students themselves and actively participated in the learning process, their PCK was enhanced (Hemler & Repine; 2006; Rushton, Lotter, & Singer, 2011). The participants strengthened their understanding of the content and had first-hand experiences with the challenges of learning the material from the student perspective. These experiences helped the participants understand what concepts may be difficult for their students to understand and helped them develop possible solutions to these difficulties. Professional development has the potential to move from content development to the use of that content in planning for more complex pedagogy. Further, professional development when teachers are in the role of student enables them to consider the conceptual challenges their own students face (Penuel et al., 2007) and offers them a fresh perspective on new material and new approaches to teaching students (Lowery, 2002). Teachers can begin to anticipate what difficulties their own students may have with the course content and to adopt learning experiences accordingly. Indeed, anticipating possible difficulties students may have with content and then making the necessary adjustments in order to address these difficulties reflect the essence of using PCK (Shulman, 1987).

Professional development can also increase teachers' abilities in reflective or metacognitive thinking about their content areas, an important component of PCK.   Teachers draw comparisons from content that they know well in order to help them explain new content with which they may be less familiar (Schempp, 1995). One example was a research study of a professional development initiative for teachers aimed at teaching a reading strategy for building text comprehension, called the Question-Answer-Relationship strategy (QAR) method (Wilson, Grisham, & Smetana, 2009).   The QAR method is a way for students to locate information in the text by using their background knowledge in order to answer a particular question. The study indicated that teachers became more aware of how to teach and implement the QAR strategy to students. As a result, the researchers found that teachers in this professional development opportunity became more metacognitive about when the strategy should be implemented and how best to engage their students in using the QAR method. Such awareness expand their PCK.

Engagement in developing and working with curriculum materials is another form of professional development for teachers that influences the development of PCK (Patel et al., 2010). Patel et al. found that teachers who worked with mathematics curriculum materials, as opposed to just focusing on a specific math concept within a professional development workshop, increased their mathematical content knowledge and understanding of student misconceptions.

Similarly, a study by Coenders, Terlouw, Dijkstra, and Pieters (2010) indicated that teachers enhanced their PCK during their involvement with curriculum design and implementation.   This study involved three science teachers in a year-long curriculum development and implementation effort during which they enhanced their PCK. The teachers

began to look at the content they were designing in a more open and thoughtful way. Each teacher employed new classroom techniques and began to move from teaching abstract concepts to teaching the content using a contextual approach. The contextual approach the teachers used in developing the curriculum involved pedagogy with which they were not familiar. The contextual approach to learning, as defined by Coenders et al., was to teach chemistry content through modules that were contained within a specific context. For example, one module the teachers developed was titled "Baking a Cake." The curriculum that the teachers developed centered on creating 8-10 lessons that would fit into this particular module. Students would learn about chemistry through the context of baking a cake. By using a contextual approach, teachers could then see what concepts related to a particular unit instead of covering content material within a vacuum. The contextual approach gave the teachers the opportunity to develop a curriculum that would help students learn material in a way that was interactive and provided real-world connections to chemistry. The teachers within this study acquired PCK by examining content in a new way and by experimenting with a new pedagogical approach that may not have happened had they not been involved in this curriculum development experience.

Professional development, as indicated by the above studies, articles, and program evaluations has the potential to impact the development of teachers' PCK. Teachers becoming learners through experiencing new techniques, approaches, and materials in their own learning can develop their PCK. In order to continue such growth, teachers can work with teacher leaders to increase their knowledge and pedagogy. The next section of the review of the literature examines the role of teacher leaders in supporting their colleagues' development of PCK.

Teacher Leaders and Their Role in Promoting PCK

School districts rely on teacher leaders to assist, advise, and mentor other teachers. A teacher leader may hold official titles such as mentor, lead teacher, or department chair. However, teacher leadership can also exist in many informal ways including discussions among colleagues in the teachers' lounge conversations, between classes in the hallway, or working within a professional learning community or PLC. A teacher does not have to hold a specific title in order to be considered a leader (Patterson & Patterson, 2004). Regardless of formal or informal authority, the role of a teacher as a leader can take many different forms and is not easily defined (York-Barr & Duke, 2004). York-Barr and Duke defined teacher leadership as a way for teachers, either as individuals or as a collective, influence their colleagues in order to improve teaching practices aimed at increasing student learning and achievement. Helterbran (2010) insisted that teacher leadership could best be described as teachers identifying a problem and taking steps to address it. Both descriptions of teacher leadership encompass the essence of what teacher leaders do. Teacher leaders are people who remove isolation among colleagues and promote collaboration among faculty. However, as varied as teacher leaders' roles may be, the focus of this section of the literature review pertains to how teacher leaders may assist their colleagues in the development of PCK.

One form of teacher leadership that can have success in helping teachers develop PCK comes from participation within a PLC. Many school districts throughout the country have officially implemented PLCs (Penuel et al., 2007). A PLC promotes teacher leadership and collaboration with the goal of improving student progress in learning. Within PLCs, teachers compare lesson plans, review student work, discuss effective teaching methods (Leiberman &

Lynne, 2011), and, most importantly, discuss student misconceptions regarding subject matter (Horn, 2011). When a community of teachers shares in leadership decisions, opportunities for assistance between teachers can develop. Also, sharing both common values and a common vision can help create an environment that is conducive for teachers to gain new-found information and to learn from experienced practitioners (DuFour, 2004). Within this type of environment, teachers may acquire more "important new information" (Penuel et al., p. 930) from expert teachers than through formal professional development. Further, when teachers have decision-making power regarding how they conduct their professional learning, they may be more likely to collaborate with others and thus be more willing to promote PCK which is the essence of a PLC as a learning community (Helterbran, 2010).

Another opportunity for teacher leadership occurs when teachers function as instruction coaches who assist other teachers in their classroom practice. A study that examined teacher leaders in the official capacity of instructional coach found that these teacher leaders possessed a greater amount of content and pedagogical knowledge than the teachers they assisted (Camburn, 2009). Using interview data as well as demographic data that included college education degrees earned and years of experience in the classroom, Camburn found that those teachers working in the role of instructional coach within the school were more experienced, held a greater number of graduate degrees, and completed more collegiate coursework within their certified discipline than the teachers they were assisting. The teacher leaders in the study significantly contributed to their colleagues' PCK and positively influenced student achievement. Other studies have also indicated that instructional coaches positively affect instruction and student achievement (Bean, Swan, & Knaub, 2003; Chval, K., et al., 2010).

Teacher leaders can also affect the way preservice teachers understand and use PCK in the classroom to help their students learn. One case study involved three preservice history teachers who were developing their abilities to use historical methods. The study found that, of the three novice teacher participants, only one succeeded in developing consistent lesson plans that displayed PCK throughout her teaching (Monte-Sano, 2011). The novice teacher who had greater success in developing lesson plans reflecting PCK received support from the directing teacher regarding how to teach using historical thought. This particular directing teacher taught using historical methodology, and the novice teacher was able to observe and thus acquire these skills. The other two participants received little assistance in using any historical methodology. Those teachers, who did not observe historical methodology teaching from their directing teacher, taught using concrete facts and dates and gave students little opportunity to engage with history as an active discipline. Not observing and learning proper historical methodology from their directing teachers significantly limited these teachers' pedagogical development. These case studies indicated that a seasoned teacher leader with a strong sense of PCK can directly influence the PCK development of a preservice educator.

Experienced teachers can also collaborate with beginning teachers in order to help foster their PCK (Lee , Brown, Luft, & Roehrig, 2007). Research with first-year science teachers focused on their growth of PCK within their first year of teaching when they worked with experienced teachers. Interviews with seasoned veteran teachers with more than 10 years of teaching experience had indicated that they had a strong grasp on PCK within their classrooms as it related to both curriculum development and teaching. Experienced teachers greatly influenced the level and extent of PCK for novice teachers. These findings further suggested that PCK is

more likely to increase the longer a teacher works in the classroom. If experienced teachers work alongside novice educators, they can use their PCK to help influence the teaching methodologies of their less-experienced colleagues.

Mentoring in another way for teachers to enhance a novice teacher's PCK. A good mentor should be able to identify and understand different modes of learning for students (Ediger, 2011). Also, a mentor must be able to supply the mentee with methodologies for teaching content. An excellent opportunity for a mentor to influence their mentee in development of their PCK occurs when the mentor has content knowledge and teaching experience within their mentee's same discipline (Grossman & Thompson, 2004). Mentors can also benefit from participating in this process through gaining experience as a leader and reinforcing their sense of efficacy.

A five-year longitudinal study about teacher learning in the language arts examined case studies of three first-year teachers regarding the type of assistance they received from their respective school districts during their first years of teaching (Grossman & Thompson, 2004). Though this study was not solely dedicated to mentorship, it did indicate that only one of the three participants actually had a mentor who taught within the same content area. The other two participants had assigned mentors, but not from their specific discipline. Furthermore, the participant supported by a mentor who taught the same content area developed deeper understanding of curriculum and how to develop lesson plans. The participant also felt more secure by having an experienced colleague who was easily accessible for any questions or concerns. This mentor's interaction led to increased PCK compared with that of the two other participants who did not have a content-area mentor.

In addition to experienced teachers helping less experienced teachers develop their PCK, can help each other improve their practice through informal interactions. Borko (1987) found that teachers interact with each other over 40 minutes per day engaging in discussion of teaching practices. The study also found that teachers tended to ask for assistance at least eight times per week. The study found that teachers help each other in several ways—finding materials; developing objectives; and discussing instruction delivery methods, questioning strategies, reinforcement techniques, and evaluation techniques. These types of informal interactions among teachers may contribute to greater PCK growth and understanding.

An interview study regarding music teachers' perceptions of learning indicated that the participants considered informal interactions with other music teachers as the most powerful form of professional development (Conway, 2008). For example, Horn (2005) focused on how teachers work with each other to develop their PCK. Within her case study, teachers reenacted interactions they had with their students in front of their colleagues in order to reflect on their practice. She also indicated that teachers rehearsed what they were going to teach in front of their colleagues in order to maintain "collective standards of pedagogy" (p. 228).

Teacher leadership also occurs through the activities of secondary-school department chairpersons. Studies and articles about department chairpersons as leaders have been plentiful, yet few studies have been conducted on department chairpersons' roles as instructional leaders (Zepeda & Kuskamp, 2007). However, the literature has indicated common functions and principles that are associated with the role of a department chairperson (Feeney, 2009). These functions are the assistance and mentoring of novice teachers, development of curriculum for a

specific department, ordering of supplies for a specific subject-area department, and serving as

an intermediary between the administration and the teachers within the department.

The department chairperson should primarily serve as a source of guidance and advice

for the teachers within the department in order to increase student learning (Feeney, 2009).

Many teachers look to department chairpersons to promote school improvement and new ideas

within the department (Kelley & Salisbury, 2013). Teachers also may be more likely to perceive

department chairpersons, rather than their principals as instructional leaders because of the

department chairpersons' connection to content and their role as teachers (Kelley & Salisbury).

Department chairpersons, who may or may not possess any real authority over their colleagues,

must also facilitate conversations among teachers within the department that address student

learning and curricular concerns (Campbell, Melville, & Barkley, 2012). When the department

chairperson is knowledgeable in her/his subject area and is a master teacher (Zepeda &

Kruskamp), they are able to interact with teachers within their department in order to foster PCK.

The role of department chairperson carries with it elements of servant leadership. As

classroom-based teachers, department chairpersons function as leaders in their own classrooms

to facilitate student learning (Sergiovanni & Starrett, 2007). This type of leadership, while

teaching, influences the way department chairpersons lead (Sergiovanni, 1992). They lead by

virtue of focusing on the importance of learning. For example, department chairpersons who

have developed PCK will carry that point of view into interactions with their colleagues.

Wettersten (1992) conducted a qualitative study of four high-school department

chairpersons. A key responsibility for the department chairpersons she interviewed was that they

were to serve as curricular advisors to the teachers within their department. Through interview

data collected from the department chairpersons and teachers within their departments,

Wettersten found that collaborative curriculum development assisted teachers within the

classroom. The collaborative environment allowed for an exchange of ideas and techniques that

contributed to PCK growth. Teachers indicated that they felt that the department chairpersons

developed a collegial atmosphere that allowed teachers the opportunity to enhance their craft.

Thus, department chairpersons, in the role as teacher leader, can have a positive effect on

teachers' classroom practice. The tasks and roles discussed by Wettersten of the department

chairpersons indicated that, through communication and cooperation, PCK can be enhanced to

help teachers become more effective within the classroom.

Teacher leaders may help their colleagues develop their PCK through the use of their

experience, subject knowledge, and curricular understandings (Gigante & Firestone, 2008).

Experienced educators have the opportunity to directly influence and help extend PCK growth

among their peers regardless of their position. Opportunities for helping colleagues improve

student learning include developing lesson plans and curricula, examining student

misconceptions of content and sharing teaching strategies. When teacher leaders and colleagues

engage in collaborative efforts, the level of PCK is more likely to increase among the faculty.

Conceptual Framework

Teachers use PCK in their classrooms in order to facilitate student learning of particular

content. Department chairpersons are individuals who help facilitate teacher growth in PCK.

Department chairpersons' PCK is enhanced through a variety of ways which include what is

learned during preservice education, as a result of professional development, and from other

colleagues. This section outlines the conceptual framework for the present study and depicts how the literature review informed its development.

The need for students to learn content is an important component that is placed at the top of the conceptual framework. Teachers develop PCK to support student learning. The process of expanding PCK by both the department chairperson and the teacher takes place within local, state, and federal external conditions. Enhancement of PCK can occur within preservice education (Boz & Boz 2008; Doppen, 2007), through in-service professional development that is informal or formal (Bullough, 2001), as well as through interactions among colleagues (Leiberman & Lynne, 2011).

The conceptual framework depicts a process whereby department chairpersons use their PCK in order to help other teachers expand their own PCK which, in turn, facilitates student learning of content (Kelley & Salisbury, 2013).
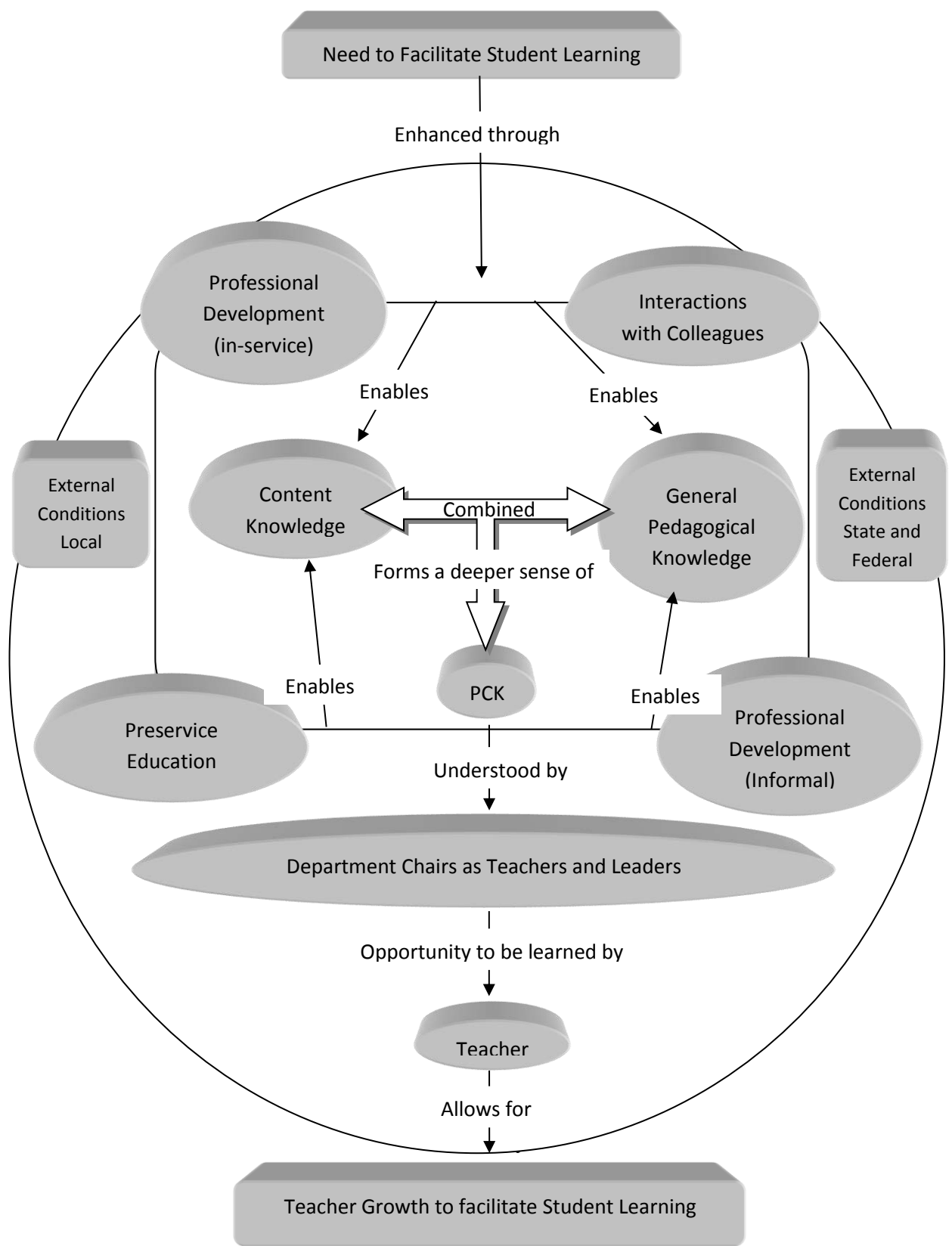
Chapter Summary

In order to provide a thorough account of PCK, this review began with an overview of the development of the concept of PCK from its initial description by Shulman in 1986 and 1987. The second section of the review indicated how preservice education can contribute to the growth of PCK in the education of preservice prospective teachers. The third section of the review discussed how professional development can increase teachers' PCK. Finally, the last section of the review described how teacher leaders can help their colleagues enhance their PCK.

The review of the literature has shown that PCK is developed by teachers from the beginning of their preservice education into the teaching profession. Teachers enhance their PCK from preservice education through both coursework and through internships. Once teachers are employed full-time within the profession, they increase their PCK through professional development initiatives that can be implemented within a school or district and can also be individual pursuits such as taking graduate coursework or independent learning. Finally, teachers increase their PCK through working in collaboration with other professionals. Often times these other professionals that assist the most in a teacher enhancing their PCK are teacher leaders such as mentors and department chairpersons.

The next chapter will discuss research methodology of the current study. The methodology will be qualitative in nature and will use interview data in order to better understand how department chairpersons understand PCK and how they see their role in assisting their colleagues in its growth. Participant confidentiality and protection will also be discussed. The literature review and the resulting conceptual framework will guide the methodology of the study.

Chapter 3: RESEARCH METHODOLOGY

The literature review in Chapter 2 provided evidence regarding the importance of Pedagogical Content Knowledge (PCK) for teachers, as well as evidence regarding how teachers continually develop their PCK. Studies have shown that teachers' PCK directly influences student learning of content. As indicated in the review, teachers acquire PCK from preservice education and professional development in interaction with colleagues and teacher leaders. However, a review of the literature indicated that few studies have focused on the development of PCK when teachers collaborate with each other or when they informally interact. Most studies reported in the literature on the subject of PCK have emphasized the importance of preservice education and the provision of formal professional development opportunities for teachers.

Thus, due to the limited research on how teachers themselves develop their PCK and how teacher leaders influence their colleagues' PCK growth, understanding these processes can provide insight into the complexity involved in the development of teachers' PCK within their world of practice. Describing how teacher leaders perceive PCK and how teacher leaders impact the growth of PCK among their colleagues can provide insight into how PCK is fostered from teacher to teacher. The department chairperson within a discipline can be one of the key individuals with enough contact and knowledge to foster PCK among teachers. Thus, the research question for the present study was: "How do department chairpersons understand PCK and perceive their role in promoting the PCK growth of their colleagues and within their

departments?" A qualitative research design using in-depth interviews with high-school department chairpersons allowed participants to share their perceptions regarding PCK and how they saw their role in the growth of PCK with their colleagues.

Chapter 3 provides a description of the qualitative research design for this study. In addition to describing the qualitative research design and the rationale for an interview as an appropriate tool to collect data, this chapter also describes the role of the researcher as a tool in the research process and the procedures followed for site selection, participant selection, data collection, the protection of participants, and data security. The chapter concludes with a brief description of data analysis procedures.

Research Design

The research question for this study was: "How do department chairpersons understand PCK and perceive their role in promoting the PCK growth of their colleagues and within their departments?" This research question will drive the data collection methodology for this study. The research question in this study sought understanding of what people think and their interpretations concerning PCK development and growth among their colleagues. Therefore, because qualitative research seeks understanding of complex phenomena from the perspective of participants, a qualitative research design was appropriate for the present study (Patton, 2002).

Qualitative research also describes complexities and processes (Marshall & Rossman, 2006). This study focused on both the complex idea of PCK as a key component in teaching and the complex process of teachers interacting with colleagues as they improve their practice. Thus, this study focused on how a specific group of teacher leaders, department chairpersons,

understood PCK and how they understood this role in helping other teachers within their departments to develop their PCK.

Other characteristics evident in the research question led to a qualitative research approach. This study focused on the perceptions of the participants in order to gauge their thoughts, beliefs, and understandings (Marshall & Rossman, 2006). Such concerns in qualitative research efforts are phenomenological to the extent that they reflect respect for how participants characterize and understand their own experiences (Hatch, 2002; Marshall & Rossman, 2006; Patton, 2002). To understand the perceptions of individuals and "to enter into . . . [others'] perspective[s]," the researcher needs to ask questions in order to learn how participants interpret the phenomena (Patton, 2002, p. 341). Thus, the study design included a phenomenological perspective within what Hatch (2002) described as an interview study. Through interview data, participants shared their understandings of how they saw PCK in their role as teachers and as a leaders of other teachers.

This present study focused on teacher leaders in the role of department chairpersons within secondary school settings. As noted in Chapter 1, the focus of the study developed from the premise that teachers learn from each other. Department chairpersons are in the unique position of holding a formal leadership title, while also maintaining a full-time teaching position. Because of this unique position, they were chosen for this study. This qualitative study focused on the complexities of the understandings held by department chairpersons in fostering PCK growth among their colleagues. In order to understand the department chairpersons' experiences and the department chairpersons' interpretation of their experiences, a qualitative

phenomenological research design was appropriate, with in-depth, semi-structured interviewing. Thus, they represent a group who function as teacher leaders.

In order to find out what department chairpersons think, believe in, and understand, it was imperative to have them offer their knowledge in an open atmosphere. The use of in-depth, semi-structured interviews enable participants to share their knowledge. By asking questions, the participants shared their perspectives of PCK.

The interview questions were semi-structured with a series of written questions developed ahead of the interviews (see Appendix A) that allowed for open-ended responses and also enabled follow-up and probing questions to be asked in response to what the participants said (Patton, 2002). The interview questions focused on key ideas from the literature regarding how teachers help students to learn content, what types of knowledge teachers use to connect teaching methodology with the content, and how they share their PCK with their colleagues. Through the use of in-depth, semi-structured interviews, data were collected regarding how the participants in this study saw their role in assisting their colleagues in their PCK growth as well as their own understandings of PCK. With such a research design, a deeper understanding of department chairs' perspectives can contribute to knowledge regarding how PCK is fostered among colleagues.

Researcher as Tool

My background relevant to this project stems from my collegiate studies and my 12 years of teaching experience as a secondary social studies teacher. In my teaching career, I have taught at the middle and high school levels. The experience and knowledge that I have gained from my collegiate studies and while serving as a teacher in the classroom, along with assistance

from fellow teachers, have helped me to become a better practitioner. My connoisseurship of teaching in the classroom has also grown through reflection on my experiences as a teacher and my review of the literature on PCK.

The researcher's connoisseurship guided the design of the present study and the procedures followed (Eisner, 1998). The connoisseurship that I, as the researcher, possess is my experience teaching in both the middle and high school levels in a public school system for 12 years. I have also earned both a bachelor's degree and master's degree in history which have helped me to understand the content that I teach. During my teaching career, I have served in leadership positions such as mentor and department chairperson. I have also learned that having both an understanding of content, and knowledge acquired through self-study and formal collegiate coursework in education, can significantly help in the facilitating student learning.

When I first began my undergraduate studies, I gravitated to the discipline of history. After I received my bachelor's degree in history, I immediately enrolled in a graduate program in history and also began teaching. Though my content knowledge grew, I had never taken a teaching methods course; therefore, I relied solely on my content knowledge in my teaching. Because I had never taken any formal coursework in the field of education, I participated in a district alternative certification program. This program provided me with a few techniques and strategies, but it did not approximate the preparation provided by a major in the field of education. However, as I gained more experience, I began to develop pedagogical knowledge through workshops, the school district's mentorship program for first-time teachers, assistance from my colleagues, and experience in the classroom. As I learned more about pedagogy, I

began to understand the deep connection between pedagogy and content in promoting student learning.

As a social studies faculty member, I have witnessed teachers assisting other colleagues. I have worked in Professional Learning Communities (PLCs) and have participated with colleagues in developing lesson plans and in analyzing everyday classroom issues such as classroom management or how to address student misconceptions regarding particular content. Also, I have had the luxury of serving under strong department chairs who have influenced my understanding of teaching and assisted me in helping students learn. Experiences in PLCs, along with receiving department chair support, have shown me that teachers influence other teachers in becoming reflective practitioners.

I have also had the opportunity to serve as the social studies department chairperson for three years. Serving in this leadership role demonstrated to me that department chairpersons garner respect from other teachers and often support department members who look to them for assistance. Serving in the capacity of the department chairperson also allowed me to observe how teachers help each other meet challenges related to teaching and how they value each other's assistance.

Site Selection

The purpose for this study was to understand how department chairpersons in secondary schools understood PCK and their role in the growth of their colleagues' PCK. The school district where the research study was conducted, located in the Southeastern part of the United States, was chosen for several reasons. The district was a fast-growing district, enrolling a diverse student population. The student population included 39.8% on the free or reduced lunch

plan; 14% of the district's population were classified as living in poverty (Federal Education

Budget Project, 2012). Of its 35,000 students, 70.1% were White, and 29.9% were classified as

minority (Federal Education Budget Project). The district's teaching staff was classified as 88%

White and 12% minority (Educational Services & Accountability Services Data Report, 2013).

The district's geographical area included a variety of secondary schools—urban, suburban, and

rural. Therefore, the district offered diversity in student population and variety in the types of

school settings. The district included 14 secondary schools with 7 high schools, 6 junior high

schools and 1 junior/senior high school. Information regarding school district grades from the

Florida Department of Education (FLDOE) website indicated that, for the nine years prior to data

collection, the district had received the grade of "A" eight times, the highest mark a school

district can receive from the State. Thus, the district had been seen as successful according to the

state grading method for public school districts.

Participant Selection

Contact was made with a school-based administrator and the assistant superintendent of

the district where permission to conduct the study seemed feasible. After receiving approval

from the Institutional Review Board at the University of North Florida to undertake the study, a

formal request was submitted to the district to contact potential participants. Formal approval

was received that provided the researcher access to department chairs in secondary schools in

order to invite them to participate in the study.

The participants in this study included secondary-school department chairpersons who

taught in numerous content areas reflected in the secondary-school curriculum. The focus of this

study was the department chairperson as both teacher and teacher leader who worked in close

contact with colleagues within a particular content area. Thus, the participants in this study were enculturated into teaching (Spradley, 1979), along with having concurrent responsibilities as department chairpersons. Department chairpersons are practitioners who are not in an official supervisory role, yet they are sources of assistance for their colleagues (Kelley & Salisbury, 2013).

Once permission was received from the district, 40 high-school department chairpersons were contacted via email to seek their willingness to participate in this study (see Appendix B). During the first round of invitations to participate in the study, only high-school department chairpersons were sent brief letters of invitation. However, because fewer individuals responded than would provide a substantive database for the study, letters of invitation were also sent via email to junior-high-school department chairpersons within the district.

Department chairpersons who indicated interest in participating in the study were sent a letter formally asking for their participation in this research. All those department chairpersons who responded that they would be willing to participate in the study were interviewed. Participants included eight females and seven males. The racial distribution within the participant pool paralleled that of the educators employed in the district. All participants were experienced teachers, with five teachers having 4 to 11 years of experience, five with 12 to 17 years of experience, and five with 18 to 27 years of experience.

Confidentiality and Informed Consent

Once the department chairs agreed to participate, they were sent the informed consent letter which they signed at the beginning of their interview sessions (see Appendix C).

The informed consent form signed by the participants stipulated key conditions for the study. Participant names and the data collected remained confidential. The participants were informed that participation in the study was strictly voluntary and that they could withdraw from the study at any time. Informed consent information also indicated that any risks to the participants were minimal. However, there were possible benefits to participating in this study; the participants had the opportunity to discuss their understandings, knowledge, and experiences regarding the role PCK played in teaching and learning in order to benefit the profession. Participants were given contact information for the dissertation chairperson, as well as my telephone numbers and email addresses, so that they would be able to discuss any concerns they had regarding the study. The digital audiotapes of the interviews were uploaded onto a password-protected secure server within 48 hours of the interviews and then destroyed. Transcripts of the interviews and notes taken during the interviews had no identifying information and were stored on a password-protected secure server. Any document matching pseudonyms with participant identities was also stored on a password-protected secure server. Participants were informed that interview transcripts and field notes would be destroyed five years after the conclusion of the research study.

In order to gain informed consent from the participants, the researcher made sure the participants were aware of the explicit purpose for the interview (Spradley, 1979). As stated in the previous section, participants were given pseudonyms to maintain confidentiality. The pseudonyms were determined from a list of former U.S. Presidents and first ladies. The participants' teaching disciplines were not named. The school district and the location of the interviews likewise were not named.

Data Collection Methodology

In order to learn how department chairpersons understand PCK and their role in helping their colleagues develop PCK, data collection occurred through in-depth, semi-structured interviewing. The in-depth interview process for this study was directed to understand the "feelings, thoughts, and intentions" of the participants (Patton, 2002, p. 341). The in-depth, semi-structured interviews fit in with the research design by allowing participants to share their understandings and perspectives of PCK (Patton). The researcher provided the participants with the scope and topic of the interviews. Acting as an instrument in data collection, the researcher was careful not to make judgments and to remain neutral. However, the researcher used knowledge from the review of literature and his own connoisseurship of PCK to engage with the participants and to probe participant responses when appropriate.

An interview protocol (Kvale, 1996) was developed (see Appendix A) using key concepts from the review of the literature in order to frame questions that asked participants to share their understanding of those concepts. Such questions ranged from opinions and values to those pertaining to the importance of assisting colleagues in PCK growth. Also, questions were developed that asked for examples of how PCK was used in their practice. Feeling questions (Patton, 2002) were also included in order to have participants discuss their own understandings of the phenomenon.

The interview protocol reflected a mix of descriptive questions and structural questions (Spradley, 1979). Descriptive and structural questions were designed to prompt the participants to discuss how they understood PCK, how they used PCK in their practice, and how they engaged with colleagues to further their PCK. Probing questions were also used in order to

assist participants in providing more in-depth responses to interview questions (Patton).

Demographic data, such as years of teaching and years of service as a department chairperson,

along with participants' areas of expertise, were collected during the interview sessions in order

to add context to the interview data collected (Patton).

Data collection took place over a period of three months in 2015. The interviews were

conducted in a location convenient and comfortable for the participants. Most of the interviews

were conducted at the schools where the participants taught, either in their classrooms or in the

school libraries. The interviews took place either during the participants planning periods or

after the school day had ended. However, one interview was conducted in a quiet place at the

local state university to accommodate that individual's professional and personal responsibilities.

Adequate time for the participants to fully answer the questions (Spradley, 1979) resulted in

interviews ranging from 1 hour to 1 ½ hours in length. In order to ensure that accurate data were

collected, the researcher recorded the interviews on two digital recording devices. The

researcher also took brief notes during the interviews that provided contextual information to

augment the interview recordings. These contextual notes were expanded following the

interviews. After the interviews were conducted and the audio recordings uploaded on a secure

server, the interview data were transcribed verbatim, along with the researcher's notes. All data,

transcriptions, and notes were stored on a secure server.

Data Analysis

This qualitative study focused on understanding secondary department chairpersons'

perceptions of PCK and their roles in promoting PCK with their colleagues. The data analysis

was conducted using educational criticism (Eisner, 1998), constructs from the review of the literature, and Hatch's (2002) typological analysis.

Because data analysis involves the researcher, it must also recognize that the researcher is a tool in this stage of the research process (Marshall & Rossman, 2006; Patton, 2002). Therefore, the researcher's connoisseurship was central in data analysis. However, in order for the researcher to make public the role of connoisseurship in data analysis, Eisner's process of educational criticism was followed. Through educational criticism, the researcher described the data, interpreted the data, evaluated the data, and developed *thematics* from the previous steps in this four-stage process (p. 103) so that the analysis was coherent and accessible to others.

In order to analyze the data that were collected, there must be description of the data to enable the reader to visualize the participants' understandings of PCK and the role PCK plays in assisting other teachers (Eisner, 1998). This stage in data analysis reported participants' knowledge and experiences. The next step in educational criticism for this study was interpretation, the process of bringing meaning to the data. However, within the process of interpretation, there must be a level of distance kept in order to explain the meaning as well as the context in which the study was conducted from the perspective of the participants. The third step was evaluation of the value of what the participants offered to the profession concerning PCK understandings. The final stage in educational criticism was thematics, that is, "identifying the recurring messages that pervade the situation" that is studied (p. 104). The themes developed within data analysis led to naturalistic generalization, that is, the themes represented knowledge with regard to PCK and provided "features one might look for" (p. 103) when considering the perceptions of other department chairpersons. These themes helped make the study

comprehensible and allowed for possible understanding of the phenomena that may occur

elsewhere among department chairpersons (Marshall & Rossman, 2006).

Data analysis also addressed participant responses with regard to topics explored in the

literature review such as preservice teachers' acquisition of PCK, the growth in PCK that takes

place among teachers, and the growth in PCK when department chairpersons work with their

colleagues. Hatch's (2002) typological analysis also contributed to data analysis. This process

involved reading the data closely to identify typologies, marking data according to the

typologies, grouping data by typologies, and describing relationships and patterns within and

among the typologies.

Credibility

To promote credibility with regard to the present study, several steps were taken to

ensure that data collection and data analysis were rigorous (Howe & Eisenhart, 1990).

Transparency in describing the development of the interview questions, the processes for data

collection, and the processes followed in data analysis contributed to the credibility of the study.

Data collection followed best practices for in-depth, semi-structured interviewing (Marshall &

Rossman, 2006; Patton, 2002; Spradley, 1979). Data collected were transcribed verbatim. To

ensure that transcriptions of participant interviews were accurate, participants were invited to

review their own transcripts for accuracy and to make changes. Three participants requested to

review their transcripts, with all of their recommendations incorporated.

The data from the research study was rich with descriptions in order to argue for claims

made in interpretations. Structural corroboration of the data collected from the interviews

(Eisner, 1998) relied on having more than one data source supporting data interpretation.

Indeed, the 15 participants provided the breadth of data necessary for structural corroboration. Further, data analysis employed referential adequacy (Eisner) by grounding interpretations in the data from the interviews and describing how interpretations were developed from those data. When appropriate, references to the literature provided rigor in data analysis. These approaches to data analysis, described in further detail in Chapter 4, contributed to the credibility of the study.

In addition, as described earlier in this chapter, transparency with regard to the role of the researcher in terms of connoisseurship and background knowledge contributed to the credibility of the study. Thus, care was taken to ensure that participants' understandings were their own conceptions and not unduly influenced by the researcher's own subjectivity (Patton, 2002).

Chapter Summary

In order to understand how secondary-school department chairpersons saw their role in facilitating the growth of their colleagues PCK, a qualitative research design using semi-structured, in-depth interview was well-suited for this study. Participants were recruited from a fast-growing school district in the southeastern United States with urban, suburban, and rural schools. This chapter also included an explanation of how participants were protected through informed consent. Also in this chapter was an explanation of how interview questions were developed using recommendations from Kvale (1996), Spradley (1979), and Patton (2002). Once the interviews were conducted, the data collected from the participants were transcribed, and both the audio recordings and the transcriptions were uploaded onto a secure, password-protected server. Data analysis was completed using educational criticism (Eisner, 1998), constructs from the review of the literature, and Hatch's (2002) typological analysis. Finally,

this chapter included how the study's credibility was supported through inviting participants to review their transcripts in order to ensure accuracy, following standards regarding the conduct of research, and through researcher attention to maintaining mindfulness and transparency with regard to the data analysis process.

Chapter 4 provides a more detailed description of the processes followed in data analysis, along with the results of those efforts.

Chapter 4: DATA ANALYSIS

The purpose of this study was to investigate how secondary-school department chairpersons understood Pedagogical Content Knowledge or PCK and how they perceived their role in assisting their colleagues and departments in the growth of PCK. In order to conduct this study, an extensive review of the literature was conducted. The participants within this study were secondary-school department chairpersons who taught in either a middle/junior high school or high school. Each of the participants taught in the same school district located in the southeastern part of the United States. In-depth interviews with 15 secondary-school department chairpersons provided the data for the present study.

The primary purpose of this chapter is to present the analysis of the data from the interviews. However, the first section of the chapter provides a description of the data analysis process which documents in detail how data analysis proceeded. Such transparency provides evidence of rigor in data analysis and meeting the standards of the field (Eisner, 1998; Howe & Eisenhart, 1990). Following the description of the process, the chapter discusses the data analysis conducted using the four dimensions of educational criticism—description, interpretation, evaluation, and thematics (Eisner) and Hatch's typological analysis (2002).

Process

Eisner's educational criticism framed the process of data analysis in order to increase readers' understanding. The researcher used the four dimensions of educational criticism—description, interpretation, evaluation, and thematics—to communicate what the data mean.

Data analysis in qualitative research involves the role of researcher. The process of using educational criticism in data analysis is based on the researcher's connoisseurship. Educational criticism makes that connoisseurship public. "Connoisseurship is the art of appreciation. It can be displayed in any realm in which the character, import, or value of objects, situations, and performances is distributed and variable, including educational practice" (Eisner, 1998, p. 63).

My connoisseurship contributed to the process of data analysis. As a secondary-school social studies teacher in American history for over a decade with an advanced degree in my discipline, I understand how important it has been in my career to be knowledgeable within the content area and how that knowledge has enabled me to foster deep student learning. However, it has not been the knowledge of the content alone that has contributed to my practice. The experience of working with other professionals, attending workshops, participating in conferences with administrators after classroom observations, and pursuing advanced college coursework have facilitated the development of a strong foundation in pedagogy. Combined, such content and pedagogical knowledge contributed to my developing PCK.

Ultimately, when I started the doctoral program in Educational Leadership and began researching Lee Shulman's notion of Pedagogical Content Knowledge or PCK (1986), I began to understand what encompassed good teaching. The blending of content and pedagogy in order to facilitate student learning was the essence of what good teachers did and what I had been trying to do from my first day in the teaching profession. As I reflected on my past decade as a teacher, I realized that with each year of teaching I became stronger at doing exactly what Shulman had written concerning PCK. I learned new methods and became more knowledgeable in my discipline. Ignited by my interest in PCK, I decided to pursue that topic in this research study.

Like the participants, I too, have taught at the secondary-school level and served as a department chairperson during my career. My previous experience contributed to my connoisseurship used in the process of educational criticism. In addition, the literature review for the present study contributed to my connoisseurship of PCK. These components of my connoisseurship formed the foundation for the process of educational criticism used in the present study.

The first two dimensions of educational criticism used in the analysis of data are description and interpretation (Eisner, 1998). Description provides a view of what the participants said in the interviews. Interpretation provides meaning for those descriptions. Due to the abstract nature of the concept of PCK, any description tends to require interpretation, as well. That is, participants' data typically included numerous examples of how they understood PCK and how they saw PCK operating in their practice and in their discussions with colleagues. Those descriptions, via examples, connected to their understanding of PCK and the accompanying meaning for the data. Further, Patton (2002) noted that "descriptions of experience and interpretations are so intertwined that they often become one" (p. 106). Thus, Eisner's processes of description and interpretation were combined in analyzing the data in the present study.

The third and fourth dimensions of Eisner's (1998) educational criticism are evaluation and thematics. Evaluation within educational criticism requires attention to how the phenomena within the data serve larger purposes. For example, as Dewey argued (1938), are teaching practices which are the focus of a given study educative, miseducative, or noneducative? In the present study, evaluation, which focused on how participants understood PCK and how

participants assisted their colleagues in PCK growth, the question is whether their efforts were educative, miseducative, or noneducative. Finally thematics, the fourth dimension of educational criticism, addresses "recurring messages" or "essential features" within the data which have "lessons to teach" (Eisner, 1998, pp. 104-105).

Therefore, the data were analyzed through educational criticism and Hatch's typological analysis. In the next section of the chapter, the first and second dimensions of educational criticism, description and interpretation, are discussed.

Description and Interpretation

The data were described and interpreted within the framework of Eisner's (1998) educational criticism and Hatch's typological analysis (2002). By drawing on Hatch's typological analysis (2002) for description, several categories or "typologies" were used to describe the collected data. Several categories framed description:

- How Participants Understood and Defined PCK,

- Knowledge of Context within Pedagogical Content Knowledge,

- Participants' Understanding of the Importance of Content Knowledge,

- Growth of the Teacher,

- Professional Learning Communities,

- and Department Chairperson Leadership.

These typologies were identified through various means. In order to generate typologies, I read the data multiple times, a process which contributed to deep familiarity with the data and reflection on the data. I highlighted salient concepts of the data and later organized them into typologies. Constructs from the literature review also suggested categories for data analysis such

as how participants understood and defined PCK, the context for PCK, the growth of the teacher in helping fellow colleagues, and the importance of working within a Professional Learning Community or PLC. Also, my own practice of teaching secondary-school students and of having served as a department chairperson helped in identifying some of the typologies such as the importance of content, helping fellow colleagues' PCK growth, and displaying leadership. Eventually, six typologies framed the description dimension of data analysis.

The typologies were constructed to illustrate how the researcher organized and analyzed the data. In the first typology, the participants' understandings and how they defined PCK were described. Also included were participants' reports regarding how they used PCK during their teaching. The second typology emphasized the context in which participants used their PCK. The third typology illustrated the significance of content knowledge for the participants in their teaching practice. The fourth typology emphasized the way participants viewed growth within their teaching. The fifth typology was dedicated to PLCs. Though this typology did emphasize teacher growth, it also described how participants understood teachers working directly together in learning communities. The final typology, entitled: "Helping Fellow Colleagues PCK Growth and Displaying Leadership," dealt with the participants' description of how they assisted other teachers within their departments and how that assistance contributed to the growth of their colleagues' PCK. The first three typologies described how the participants understood both PCK and content knowledge. The fourth and fifth typologies described how the participants understood the ways a teacher grows within the profession and how PLCs contributed to teachers working together to help students learn. The organization of the typologies moves from how

participants saw their own practice to participant perceptions of how they work with colleagues in developing PCK thereby helping students learn.

As stated in the previous section, because of the abstract nature of the concept of PCK, any description of the data requires interpretation. The participants' data often contained examples of how they understood PCK and how they saw PCK functioning in their teaching and in their discussions with colleagues. Therefore, description through examples connected with the participants' understanding of PCK and the accompanying meaning for the data.

How Participants Understood and Defined PCK

The category of PCK understandings describes the participants' own perspectives regarding the complex nature of PCK. Their views varied.

One of the examples of how the participants understood PCK dealt with the use of hands-on instruction. Participants referred directly to the need for teachers to possess content knowledge and understanding in order to engage students in learning experiences that were hands-on and student-centered. Barbara described how she used hands-on instruction to support student learning: "I start the unit with some sort of simulation that they're [students are] doing where they kind of have to play out a scenario." Barbara described how she began her lesson with a simulation in which the students had to actively be involved with the subject matter. Barbara knew the content well enough to develop a scenario and understood that her students could learn through a scenario activity, awareness that displayed her PCK (Ball et. al, 2008; Shulman, 1987).

Another participant example described a hands-on approach required indicated that an understanding of the content deeply was needed in order to allow students to work in a hands-on

environment. Ronald stated, "My role is more of a monitor and have them [the students] talking and working, and then I'm trying to redirect them to the key points." Ronald understood what he wanted the students to learn within a lesson, but allowed them to find their own path while he acted as a facilitator. He possessed the confidence that his students could learn the material even though he was not directing them to the information. Ronald had clear goals within the content area and used his own pedagogical expertise, both of which reflected his understanding of PCK.

The hands-on approach that the participants described using in their classrooms directly relates to PCK. In order to develop learning experiences that are both effective and engaging, teachers must understand the content, the students, and the environment in which they are teaching (Doppen, 2007; Shulman, 1987). By understanding the content, students, and the school environment, teachers are able to develop more rigorous lessons which make possible in-depth student engagement that, in turn, leads to student learning (Westhoff & Polman, 2008).

The participants also understood that hands-on teaching becomes more effective when students have a basic understanding of some of the content. Patricia, a Certified Technology Educator or CTE, stated that she would "try to present historical information, historical background, just like the hot air balloons, just like airplanes or rockets. Present the information and then they [students] get to create something." This statement clearly showed that Patricia intended for her students to develop an understanding of the origin of aeronautics to assist in a classroom project. It was Patricia's understanding that by teaching the students the background information, they would gain a deeper knowledge of the content and thus gain a richer experience while completing their assignments.

Patricia's reference to students gaining background knowledge on a topic before proceeding with the assignments reflects Shulman's (1986) emphasis on background knowledge and the vertical curriculum. The vertical curriculum is the content within a discipline across all the years of schooling. A major component of PCK deals with understanding what the students already know and what they need to know in order to move forward. By providing the students with historical information regarding the content, Patricia was providing that necessary background information that they did not possess (Ball et. al, 2008; Frykholm & Glasson, 2005). After students developed background in the history of aeronautics and rocketry, they used that information to help them better understand how to work on their assignments. Patricia displayed PCK in knowing that the students lacked the background information and that the historical aspects of rocketry would assist her students in their assignments (Frykholm & Glasson).

In his mathematics classes, George also used background knowledge by sharing "historical stories of mathematicians' lives to make the math more real." These examples of the actual people who developed the mathematical concepts taught in the course made the subject matter more tangible and less abstract for his mathematics students. As Huntley and Flores (2010) suggested in having preservice educators take a history of mathematics course, George expressed a similar sentiment in his discussion of teaching his students about historical mathematicians. By teaching the history of mathematics and mathematicians, George provided clarity and the use of the mathematics he taught; such an approach reflected his PCK. The students gained a greater appreciation of the field and, thus, developed a deeper understanding of the subject matter (Greenes, 2009).

Another key component of PCK addressed by the participants was their need to understand student misconceptions within a given content area. Participants discussed some of the misconceptions that their students had and how they addressed these misconceptions. Ronald's science lesson focusing on "Falling Bodies" addressed student misconceptions that were "global. The majority of kids will say, for example, that bigger objects will fall faster than lighter objects. [For] 2000 years, they believed it; Galileo got in a lot of trouble trying to prove otherwise." Though Ronald spent "a couple, three days on that [lesson on Falling Bodies] because even after all that stuff I'll do with them [the students], I'll wait two days and ask the same question again and some people will still say the same thing. . . . Once people get a certain kind of thinking in their head, it is very hard to get it out." Even when given the opportunity to address content that challenged those misconceptions, still many of Ronald's students struggled to abandon their previous fallacies regarding the content. Teachers with well-developed PCK recognize how challenging it is to confront and to modify student misconceptions that impede learning.

Jacqueline discussed a different type of misconception than the one Ronald referenced. She stressed that teachers needed to be careful concerning their own misconceptions of their students' background knowledge. Jacqueline argued that teachers would "have to withdraw . . . [their] own knowledge from the setting." By "withdraw your own knowledge," Jacqueline was stating that teachers cannot begin their lessons without providing the appropriate background information as well as being mindful of the limited knowledge-base of many of their students. Jacqueline recalled that she had "seen too many teachers take for granted that the kid [student] knows something that should be obvious to [the student] . . . and back 10 years ago it would have

been, but it isn't anymore." She then emphasized, "If you [the teacher] assume they [the students] know things because you know them," then that becomes "the difficult thing for the teacher . . . to know what they [the students] don't know." Jacqueline argued that it was incumbent on the teacher not to presume that students possessed specific background content knowledge, but rather it was the teachers' responsibility to ensure that students understand the material throughout the lesson.

Ronald and Jacqueline both discussed the necessity for teachers to address student misconceptions. Ronald discussed the misconceptions regarding content that students bring into a class which need to be addressed so that a teacher can help them learn. Ronald's observation directly related to an important aspect of PCK, that of teachers understanding content misconceptions likely to exist with a given content area (Barrett & Green, 2009; Shulman, 1987). On the other hand, Jacqueline referred to teachers' misconceptions regarding the background knowledge that students may have coming into the classroom. From her perspective, teachers should not assume students know things within the content area; rather, they should make sure their students have the required understanding before moving forward in the lesson. By understanding the misconceptions regarding students' knowledge made by some teachers, Jacqueline displayed insight into the pedagogical criteria teachers must recognize in their teaching. Jacqueline displayed her PCK by understanding how the possible presumptions in some teachers' judgement concerning students' prior knowledge that can negatively affect student learning (Ball et. al, 2008; Kelley & Salisbury, 2013).

Participants' understandings of PCK were also evident in the learning outcomes they wanted their students to achieve. One example of developing learning outcomes was discussed

by Zachary. Zachary wanted his students to be able to read a novel through the use of an interior voice.   At the beginning, Zachary "read the first couple of chapters with them [the students] to help them find their interior voice." According to Zachary,

> they [the students] do not have an interior voice that makes it [the text] come
>
> alive; but, . . . I describe to them the reading process and that I'm shooting a
>
> movie in my head while I'm reading something. I try to model first; then I kick it
>
> off with them so that, in the absence of interior voice, they have my voice.

Zachary modeled the style of reading he wanted from his students and then had them use the prescribed method. Zachary's statement showed the depth of his knowledge which reflected what Ball et al. (2008) referred to as the knowledge of curriculum and students and the knowledge of content and teaching. Therefore, he used his knowledge and his understanding of curriculum content in order to make clear what he wanted his students to do while they read. His modeling ended only after he felt comfortable that the students could read more deeply and accurately using an interior voice. Thus, he demonstrated his knowledge of content, teaching, and students (Ball et al., 2008).

Franklin also described the methodology behind his pedagogical approach that focused on vocabulary within texts. "Our class in civics is based upon vocabulary, and what we do is we pull out the words we feel like are most important. . . . [The students] write me a sentence . . . using the term. [Students also] draw me a picture; [they] illustrate that term." Franklin built upon his initial introduction of vocabulary by following with a classroom discussion of "interacting with the class. It's me saying some things, talking with the class, and asking them questions. They can be very low-level basic questions, and we are building to higher-level

questions within the lesson." Franklin showed an understanding of scaffolding (Ball et al., 2008; Shulman 1987).

Franklin began with vocabulary, then worked with lower-level questions, and gradually expanded the questioning to become more rigorous and complex. This approach related to Shulman's pedagogical reasoning cycle that described the process of effectively teaching a concept. Franklin's use of vocabulary illustrated what Shulman (1987) called the Instruction component within the pedagogical reasoning cycle. The Instruction component is where the subject matter is taught directly to the students (Shulman).

The participants also exhibited their understanding of PCK when they discussed the importance of real-world applications of content (Even, 1993; Graeber, 1999; Piccolo, 2008; Shulman, 1986). Woodrow described his mathematics course: "You have to bring it into the real world scenario for them [students]. They always want to know how are they going to use it [mathematics] in real life." This statement showed Woodrow's understanding of his content area that influenced his ability to provide his students with the relevant applications of what he was teaching.

Abigail also used real-world examples with her eighth-grade science students in order to make the content more concrete and easier for her students to understand (Even, 1993; Graeber, 1999; Piccolo, 2008; Shulman, 1986). To clarify the concepts of input and output, Abigail described using the toaster as an example: "You put the toast in. Then they connect. It's gotta be something they understand." Abigail's understanding of the content area enabled her to find a real-world example that would simplify the lesson for her students (Ball et al., 2008; Shulman, 1986).

Reflection is another key concept within PCK. Participants stated that reflection was a critical part of their teaching. Mary said that during summers she would "go through [lesson plans]. I see where this isn't working, and I write little notes." Franklin stated that "I feel like you can always look back at a lesson. . . . What kind of changes [can I make]? How can I tweak that to be better?" The participants' use of reflection gave them the opportunity to think about the lessons they developed, how successful these lessons were, and what adjustments were needed in order to develop better lessons (Bailey, 2010; Benton & Benton, 2008; Hofstein, Carmeli, & Shore, 2004; Penuel et al., 2007; Shulman, 1987; Van Driel & Berry, 2012). Shulman (1987) described reflection as teachers' analyses of their performance and use of evidence regarding how effective their teaching was in helping students learn. Through reflection, teachers refine their PCK (Shulman).

Participants also reported that they used reflection as they taught during the school day. Betty described her process:

> For example, if that reflection is from 2nd period class to 5th period class I can
>
> reflect. . . . They were all the same class. Even that brief moment of reflection
>
> can help me be a better content area specific teacher because I'm figuring out
>
> what works and what doesn't work with those students.

The above statement is a prime example of teachers using PCK to continually modify their instruction throughout a school day by reflecting and analyzing how a previous class responded and understood the material. Michelle stated that "with any profession, any teacher who was reflective at all will change their lesson plans throughout the day to accommodate a more successful approach." Through the reflection process, teachers both think about and analyze

their past teaching experiences and make the necessary adjustments to improve their instruction. This reflection process contributes to the development of teachers' PCK because it helps teachers enhance their teaching practice (Bailey, 2010; Benton & Benton, 2008; Hofstein, Carmeli, & Shore, 2004; Penuel, et al., 2007; Van Driel & Berry, 2012).

Jacqueline summarized the essence of PCK with the following statement that dealt with understanding multiple facets of successful teaching.

> If the teacher knows the content, especially if you've done the same curriculum year after year, you know things they [the students] need to do visually, which things they need to know from reading about them, which things you don't need to spend a lot of time on, and which things you can't take for granted.

The participant understood that, in order to better help students learn, a teacher must understand the content and be familiar with the curriculum that is being taught. Jacqueline discussed the element of experience in teaching the "same curriculum year after year" which contributes to the pedagogical knowledge a teacher needs to teach the content area and what content to emphasize with students. This knowledge of the structure off the content area relevant to a particular course has significant implications in helping students learn (Berliner, 1991).

Knowledge of Context within Pedagogical Content Knowledge

This category describes how participants acknowledged the role of the classroom and school setting in their teaching. This category differs from PCK Understandings because the context of PCK deals directly with the participants' awareness of the student-teacher relationship and the awareness of student behavior, the learning environment, and student abilities. However, this category is not dedicated to the direct instruction of students and, therefore, does not place

emphasis on content knowledge or teaching methodologies. Rather, this section examines the other factors that help make up teachers' instructional decisions that contribute to student learning.

The data reflected the importance of the relationship between student and teacher as part of the context in which PCK operates. Woodrow stated that "you got to let it be more than just a math class for them. You got to let them feel like they can come to you." Franklin noted that the students he taught needed "to be able to trust the teacher. There must be respect. I think respect is important." Ronald also indicated that "students have to be comfortable with you emotionally. . . . They have to feel psychologically safe and obviously physically safe." These statements indicate that participants recognized that the relationships developed between students and teachers needed to include trust and respect. Thus, they acknowledged that to provide the appropriate learning environment, teachers must understand and know the students they teach (Ball et al., 2008; Frykholm & Glasson, 2005).

Betty commented that teachers must also "meet [the students] where they are. . . . I think that's important, especially for high school kids." Here is evidence of a teacher's attentiveness to the type of students she was teaching. She acknowledged the importance of teachers knowing their students and the abilities that they possess so that they can adapt their teaching to meet the needs of their students (Coenders et al., 2010).

Like Betty, Laura also used knowledge of her students to increase learning. Even though Laura taught some advanced students who fully understood the material, she still needed to work with a particular student who was struggling. She therefore spent "a lot of individual time with him. I can get away with it in this class because I have AP [Advanced Placement] students that

are pretty self-motivated and that allows me to work with him." Laura reported that understanding her students' abilities enabled her to target and dedicate more time to her struggling students. Laura displayed her understanding of the context of PCK by discussing how she met individual student needs within the classroom, a central component of PCK reflected in the literature (Ball et al., 2008; Frykholm & Glasson, 2005).

Woodrow also exhibited an understanding of the mathematics students he taught when he modified class assignments to accommodate student needs. "I don't believe in 50 problems. If you can do it in 10 problems, I'm good with that. But, if you need to do the 50, then we'll sit over there and do the 50, and we'll pull this desk over there." This statement indicated that Woodrow recognized that, within his classroom, his students would have different needs in order to learn the subject matter. If students in Woodrow's classroom understood the concept quickly, they did not need extra practice. However, students who needed more practice were afforded that opportunity.

By understanding the types of students within the classroom, a teacher can better provide what students need in order to facilitate learning. Through this context of PCK, a teacher shows planning and organization. A teacher operating within the context of PCK has the ability to develop a lesson that meets the needs of students with varying academic abilities (Shulman, 1987).

Mary, a middle school English teacher, indicated that she adjusted her style of teaching depending on the time of day for a class. She stated that:

> I do a lot of jumping around, moving around, tapping the kids, touching the kids,
> rubbing them on their heads, hugging them because that's what they need. It's the

end of the day. We've gone through the whole day, we've done P. E., they've

eaten, they're ready to go home, but they still have a lesson to learn. So, I'm

totally different with them than I am with my fourth period class . . . [who are]

very astute. They're very eager, very into it, and know a lot because most of them

are gifted.

Mary acknowledged the context for PCK through both her understanding of her students'

academic differences and her recognition of how different times of day influence students'

attentiveness for academics. Thus, she adjusted her behavior in order to engage students in the

learning process.

Michelle also recognized that understanding students' abilities was extremely important

in her teaching of reading. She brought the career counselor to her classes to work with the

students individually. "Then I can tailor the content area. . . . So tailoring it to what they are and

who they want to be; it's not a cookie-cutter approach." Though Michelle's class was dedicated

to helping students become more proficient in reading, she wanted to establish a classroom

environment that engaged her students in areas that were of particular interest to them as

individuals. By doing this, Michelle reported that many of her students improved their reading

comprehension and improved their scores on district and state reading assessments.

Mary and Michelle displayed knowledge of their students and knowledge of the classes

they taught which reflect the knowledge of context within PCK (Ball et al., 2008).

Understanding students' behaviors and skill levels, along with knowing content, curriculum, and

pedagogy, reveal a high level of PCK (Barrett & Green, 2009). Both Mary and Michelle used

unique ways to reach their students. Teachers who understand their students' abilities are

revealing PCK (National Council for Accreditation of Teacher Education, 2013).

Context knowledge within PCK is also evident when teachers allow their students the

freedom to participate in learning activities with limited intervention. In order for teachers to

develop learning activities in which students operate independently with limited assistance, they

must have not only deep knowledge of the concept being taught and the assignment given to the

students but also knowledge of the students. For Theodore, a science laboratory assignment

requited "knowing what's going to happen, given any particular circumstance . . . [and]

understand[ing] the risk/reward benefit with allowing a kid to try something on their own. See

what happens if they make mistakes and go from there." Theodore's description reveals several

points. First, he carefully developed the laboratory assignment and anticipated the possible

outcomes for students. He also recognized the value of allowing students to make mistakes, and,

if they did, he could observe how they handled these errors which would then provide him

further information regarding how his students learned.

Patricia pointed out a problem that she had encountered while allowing her students

opportunities to work freely to make mistakes:

> This [process] didn't work, and it takes longer. . . . You know kids finished, and
>
> you got some kids over here still working and designing. . . . You got some kids
>
> already done, and they're not—they don't want to add any more to it. You got to
>
> deal with their possible behavior.

Patricia brought up the point that if students were knowingly allowed to make errors on a project,

then it could lead to some of the students in the class moving more slowly than others due to

making more mistakes. Learning activities during which students work with limited help from the teacher can lead to some students finishing earlier than others because they encountered fewer difficulties. Thus, classroom management issues could arise with idle students simply waiting on their classmates to finish. Although Patricia acknowledged the advantage to having students experiment, she ultimately decided that, for her particular group of students, the classroom projects needed to become more regimented and teacher-directed.

Knowledge of content and knowledge of the student are key components in PCK (Ball et. al, 2008) which both Theodore and Patricia acknowledged. They both developed their own lessons to help students learn (Kahne & Westheimer, 2000) by allowing their students to work independently even though students might make mistakes. These teachers understood their content well enough to develop projects and experiments for their students. However, whereas Ted found success in allowing his students to work through the laboratory assignment and even make errors, Patricia learned that her particular group of students needed more direction during projects in order to stay focused and to complete their work within a given timeframe.

The context knowledge within PCK also includes positive teacher attitudes regarding the content. Zachary remarked that, in order to for a teacher to have students read a novel, "you ha[ve] to sell it with . . . enthusiasm. . . . Enthusiasm is infectious." Patricia remarked that, "if you're really knowledgeable about it and really passionate about something, then the kids pick up on it, too, and they get excited." Both Zachary and Patricia recognized that their enthusiasm and passion with regard to the content area can motivate students to take part in the work. Demonstrating these qualities of teacher behavior reflects the contextual knowledge embedded within PCK. The next section explores the importance of content knowledge in more detail.

Participants' Understanding of the Importance of Content Knowledge

As a typology for data analysis, the importance of content knowledge reflected how the participants' viewed teachers' knowledge of subject matter. Participants indicated that content knowledge was vital for a secondary teacher. The participants clearly stated that content knowledge formed the foundation of effective teaching. As Schwab (1969) stated, teachers need specialized understanding of a subject area. In order to teach a specific discipline, a conceptual understanding of that discipline is critical (Ball, Thames, & Phelps, 2008; Berliner, 1991). This understanding is foundational for PCK.

In the present study, participants suggested that students benefited from teachers who possessed high levels of content knowledge. As Betty stated, "You've got to know what you are talking about. The kids are relying on you to be an expert in it. More of an expert than they are, if that makes sense. They are relying on you to impart any wisdom of what you might have." Betty remarked that teachers need to have more than just familiarity in their content area, but rather teachers should be experts in their discipline.

George added another component to the concept of teacher expertise in the content area. "You [the teacher] should be able to answer students' questions regarding your subject. Even if they are challenging." According to Zachary, "At the high school level, it's [content knowledge is] critical because you're going to run into kids that will challenge your content knowledge." George and Zachary described why knowing subject matter enables educators to answer and address student questions. The implication is that the more content knowledge teachers possess, the more confident they are in their field and in helping students learn (Lowery, 2002).

Indeed, the participants felt the lack of content knowledge could be damaging for a teacher in helping their students learn. "I think if you don't know what you're doing content-wise, you kind of maybe come in blind [to teaching], and so then it can be an uphill battle." Statements such as this one made by Theodore described that a lack of content knowledge was a deficiency that would be difficult to overcome. George echoed the sentiments expressed by Theodore with the following statement: "Students, especially high-level students, have to know that you understand your topic and that you can handle the material. They know if you are struggling." Betty also emphasized that "if you don't understand the content that you're teaching, then the students aren't going to understand it." Herbert noted that "if we do not have that [content knowledge], we're not going to be able to concentrate to be able to learn the very complicated things we are teaching and the students are learning."

Teachers with limited content area knowledge are forced to use valuable time in learning the subject matter instead of using that time to focus on how best to teach the content to the students. Not needing to focus on the content to instead focus on student learning requires that teachers have a strong base knowledge of the subject area when they enter the classroom (Even, 1993; Piccolo, 2008).

Therefore, when teachers do possess more content knowledge, they can develop richer, more in-depth learning experiences for their students (Anderson & Hoffmeister, 2007). Abigail acknowledged the necessity of content knowledge when discussing the process of developing lessons for students. "When you understand more about what you're teaching [the content] and the ways to get to the kids, I can see other lessons that I can create to get it [the subject matter] to them."

Participants also indicated that the more content they possessed, the more nuances they could use within their content area to assist their students. Woodrow elaborated on the importance of content area specialists needing to teach within their specified field to simplify student learning. As a mathematics teacher, Woodrow noted: "If I take a non-math person and say 'teach a two-step equation to them [students],' they'll show them to move it here, move it there, move it to there; they don't know the trick of anything." Woodrow's implied that someone with less content knowledge would be unlikely to know diverse methods to solving a problem. However, someone more knowledgeable in the field could increase student understanding by offering multiple ways to work with the content (Anderson & Hoffmeister, 2007).

The participants required the importance of consistently expanding their content knowledge. A prime example came from Franklin, a social studies teacher: "As a teacher, it's going to be good for me to be paying attention to the news—at least reviewing several different sources so we can talk about it. . . . You want to be able to discuss current events." By keeping up with current issues, Franklin brought relevant content into his social studies classroom and expanded his own content knowledge. Similar to Franklin, Barbara's deep familiarity with the content allowed her to reach for other examples of the subject area to assist in her teaching. "If I have my pre-setup example to explain something [and] if they [the students] don't get it, I can fire off two or three more [examples] right away." Jaqueline stated that she attended various United States history summer teacher institutes to increase her content knowledge. She emphasized that these institutes provided "insights that I [Jacqueline] would never have gotten." Content-based workshops, like the ones Jacqueline mentioned, provide an immense amount of

content information that assists teachers with their teaching (Hemler & Repine, 2006). Ronald enhanced his content knowledge when he went to a university over a summer to participant in a program dedicated to teaching science. Ronald reflected on how much content he learned from this program and how helpful it was for his teaching. Participation in university programs or simply taking a content-area college course can increase teachers' content knowledge (Dall'Alba & Sandberg, 2006).

Content knowledge and expanding content knowledge are extremely important to good teaching (Ball et al., 2008; Westhoff & Polman, 2008). Ronald summed up the importance of content knowledge for a teacher within the classroom with the following statement, "knowing the content can [bring about] . . . the purpose of knowing what the content is so it's not just a dry academic activity, not just punching a ticket for a standard."

Growth of the Teacher

The typology, Growth of the Teacher, describes how the participants understood their own development of professional knowledge. This typology represented how participants understood teachers' growth through professional development and what that process looked like to them, but also how their descriptions related to the literature on professional development.

Participants indicated that one of the key ways that teachers grew as professionals was through actual teaching experience. Betty remarked: "I think the first thing [teacher growth] is from classroom experience." Betty added that "the actual classroom experience; doing, succeeding, failing, that's where you're going to learn . . . what you're supposed to do as a teacher." Zachary also indicated that growth stemmed from teaching experiences that allowed for "trial and error; you have to find your own thing that works." Laura observed that "[teacher

growth is] more just experience-based; it's going to come a time that . . . [teaching is] just not that overwhelming, that you know that you're fine with it [teaching]." The participants felt that, through learning by doing, they were able to enhance their content and pedagogical abilities.

The participants emphasized that the act of being a teacher and gaining more experience positively impacted their professional growth. Teachers must be able to learn from their experiences which contain both successes and failures. The participants discussed the importance behind "trial and error" for a teacher, which is a concise way to say that a teacher learns from classroom successes and failures (Doppen, 2007). Ultimately, the growth of teachers takes place when they internalize these classroom experiences in order to inform them ineffectively with helping students learn.

The participants also felt that learning from other, more experienced educators was helpful in their growth as educators. Franklin said

> I think that you need to rub shoulders with people who are master teachers. . . .
> It's important to link up with people like that. I think it's good for people to sit
> underneath . . . their leadership or tutelage, so to speak. Ask them questions, go to
> meetings where they talk about their craft, talking . . . [with] people who are
> seasoned teachers.

Franklin believed in learning from those teachers who were successful. Working with and learning from seasoned teachers can contribute to fostering a teacher's growth (Borko, 1987; Horn, 2005).

Like Franklin, Woodrow and Mary also discussed working with veteran teachers in order to learn about new ideas and ways of teaching. Woodrow reported that

We have group emails, and I sit in there and say, "I didn't know you did that. So,

send it to me." So, I know a lot of math teachers within the county, and we

socialize outside of school, and we get a lot of that. Like I said, you can't be a

single entity; you have to build on [each other].

Woodrow not only exchanged emails with other teachers regarding their practice, but he also met

socially with teachers from across the district. Mary likewise worked with teachers in the

district. She indicated that learning from others in a collaborative atmosphere helped her grow

professionally. Mary acknowledged that teachers grew

through collaboration with their peers as well as collaboration with the county.

You talk with . . . the teachers in your school, in your department, your grade

level, that kind of thing, but then you also meet and chat with teachers in the

county.

Both Woodrow and Mary found that working with other professionals from their same discipline

was helpful in enhancing their own knowledge. When teachers learn from other educators

within the same discipline, they grow within their teaching practice and also gain more content

area knowledge (Grossman & Thompson, 2004).

Learning from other teachers who are seasoned can be both informal and formal. The

previous examples discussed by the participants reflect an informal approach to learning from

other educators. However, a more formal approach can occur when teachers engage with a

teacher mentor to help them grow (Grossman & Thompson, 2004). Mentorship is a direct

relationship between two individuals with the purpose of helping the mentee grow within his or

her craft (Ediger, 2011). Franklin recalled,

> I also had mentors early in my career that encouraged me, gave me direction. [I]
>
> had the doors of communication that were open, so, if I ever felt like I got stuck,
>
> or I didn't know what to do, I could come back to them, talk to them [my
>
> mentors].

Teachers often have mentors early during their first years in the teaching profession. When these teachers are paired with experienced educators, there can be lasting and positive effects on the growth of teaching knowledge (Lee et al., 2007).

Betty focused on mentoring as a process that could be beneficial at any point in one's career:

> I also believe that you grow and working with other teachers, particularly if you
>
> can have a mentor—another teacher who does what you do, but you can actually
>
> see them do it in the classroom. So, it really is a combination of you going out
>
> there teaching and observing others doing the same thing.

Franklin and Betty thus emphasized that teachers have mentors who can support their growth throughout their careers.

Teachers can also grow within their field through professional development. A teacher can participate in professional development in many ways. For example, teachers can attend summer institutes and school-directed and district-directed workshops. Teachers can also take college course work and develop their own professional growth through self-initiated learning (Bullough, 2001).

The participants in this study also discussed the professional development that they completed. Jaqueline and Ronald attended summer institutes which helped both of them expand

their content knowledge. Jaqueline reported: "I've been to Tulane University to study Revolution to Civil War. . . . I went to the gold fields in Sacramento with the National Endowment for the Humanities." Jaqueline's professional development experiences provided her with more "personal stories and references" that enabled her to use more detailed content while she taught. Ronald recalled "a two-week physical sciences [institute], math in the physical sciences sponsored by a state university." He gave a brief example of learning "how to put these [quadratic equations] on excel spreadsheets to get them to kids to understand probability density curves." Both Ronald and Jaqueline discussed the advantage of gaining more in-depth content through formal professional development experiences in order to help their students learn (Anderson & Hoffmeister, 2007; Hemler & Repine, 2006).

Aside from attending summer institutes, participants discussed participating in other forms of professional development to enhance their knowledge and increase student learning. Abigail noted that she was "in CAR-PD [Content Area Reading Professional Development] and that's reading the text," because at her school "we try to incorporate all of the reading skills." Michelle remarked that "there are webinars for our specified field, our classes" and that she was "all over these websites." Woodrow even considered that he may "go audit a college course over the summer" because he was not sure what classes he might be teaching the following year and wanted to be prepared if he taught a new course.

These examples from the participants indicate that professional development was an important avenue for their growth as teachers. Even when not speaking directly about specific professional development experiences in which they had participated, the participants indicated how critical they could be for their success as teachers. Further, Laura recognized that

professional development was something "that has to be ongoing throughout someone's teaching career because, if not, how are they going to learn those methods?" Laura thus supported the argument that sustained professional development can be effective for a teacher and enhance learning and professional growth (Van Driel & Berry, 2012). Zachary even remarked that professional development throughout one's career should meet different needs. "I guess the more advanced your content knowledge, the more unique the professional development has to become." Zachary's statement emphasized that the more knowledgeable a teacher is, the more differentiated the professional development needs to be in order to increase teacher expertise (Lowery, 2002).

Finally, Franklin discussed the use of self-chosen professional development. "If you feel like you have a weakness in an area, to do some study on your own, like read books, [and] get the background knowledge." Franklin illustrated the point that when teachers have autonomy in choosing what types of professional development in which to participate, then they can directly influence their development of knowledge in teaching (Van Driel & Berry).

Professional Learning Communities

The Professional Learning Community, or PLC, occurs when groups of educators come together in order to learn and grow within their profession. The use of this typology is to discuss participants' description of the PLC and how their observations relate to the literature. Teachers working with each other in PLCs enables them to consider different teaching styles and methods that can help students learn content (Leiberman & Lynne, 2011; Penuel et al., 2007). Work within a PLC can facilitate teachers' growth in Pedagogical Content Knowledge through both learning how other professionals work within their own classrooms and through collaborating

with a set of teachers over issues of student learning (Horn, 2011). PLCs enable teachers to explore new lessons and approaches that can help their students learn and understand the content.

This typology describes how the participants understood and worked within the PLCs in their own schools. According to the participants, the school district in which they worked mandated participation in formal, content-specific PLCs organized around course assignments. The participants found that much of their collegial time was spent inside these PLC meetings. PLCs contribute to teacher growth (DuFour, 2004) and thus could have been discussed within the previous typology; however, because the participants used PLCs as opportunities for much of their collaborative work with their colleagues, it became increasingly important to describe participants' statements concerning PLCs within a separate typology.

Many school districts have mandated PLCs with scheduled time for their teachers to meet together (Penuel et al., 2007). As stated above, the school district in which the participants worked mandated PLCs as a form of professional development. George, however, conveyed a concern that teachers who teach two or more different courses within the school year are only able to work in a PLC for one of those courses.

> PLCs do exist at the school by subject only, and everyone is in one PLC, and they
>
> do some common planning; however, if you teach more than one prep [course],
>
> you do not meet with that second group in a PLC.

PLCs do not need to be made up of teachers who only teach the same specified course. The district in which the participants taught, however, had teachers meet in PLCs based on just one particular course they taught. Regardless of this drawback, George recognized that a PLC can lead to common planning among teachers and that "everyone" participated within one.

Like George, the other participants indicated advantages of participating in PLCs.

Abigail reported: "So we share a lot of ideas; we work on lessons together." Like Abigail,

Franklin described his experience:

> When you're meeting together in your grade level, you have several teachers who
>
> are all teaching the same content to the same age kid. You're going to have a lot
>
> more in common, and, therefore [you] . . . can say, "OK, how did you teach this
>
> lesson on the five forms of government?"

Abigail's and Franklin's statements indicated that working in PLCs with teachers who taught the

same content can assist all involved in learning new methods of teaching the subject matter.

The PLC process can benefit teachers by allowing them to take on leadership roles, as

well as by allowing them to work together (Leiberman & Lynne, 2011). Patricia recognized

these two purposes: "We do talk about best practices, things like the writing and the reading."

According to Jaqueline, "The whole purpose of us being together and collaborating—I'm

supposed to lead the conversation, but we're collaborating in strategies."

Participants discussed how they collaborated with their colleagues and what that process

meant to teaching. Patricia noted that "I think that's really all you can do is share information. . .

. I listen to them [PLC members] about what they say and their sharing, and I learn from them

about what they say as much as they learn from me. It's a constant learning process." Mary

shared that her PLC may "discuss problems we may be having with teaching a particular child or

a particular group of kids, or sometimes there is an idea we heard about teaching." Betty added

that, within her PLC, they "would bounce ideas off of each other and sometimes . . . I think the

teachers talking, bouncing ideas off of each other does help." The participants took the opportunity provided them in the PLC to learn from one another—an important reason to work within a PLC (Penuel et al., 2007). This sentiment was summed up by Abigail: "I think everyone grows by learning from one another."

Another major driver of a PLC is the group working toward a goal and a common vision (DuFour, 2004). The participants indicated that much of their PLC work was dedicated to a specific goal. Ronald, for example, reported that his PLC decided to "discuss learning targets of the students for the year" and worked toward achieving those targets. For Abigail, much of her PLCs work was dedicated to students passing the science FCAT. Betty shared: "Our PLCs are mostly focused on the new state assessment exam." Franklin also stated, "We [The PLC] pretty much talk on a weekly basis anyway because we're giving an end-of-course exam, so it's important for us to kind of be heading in the same direction." Having a goal, be it developing learning goals or preparing for an assessment, provides direction within a PLC, especially if it entails discussion and decisions designed to help students learn (Leiberman & Lynne, 2011).

Within their PLCs, participants also discussed what materials and resources they would need to help students learn. In Mary's PLC, the discussion pertained to "what books do we want to incorporate, what books do we want to push out to the rest of the staff that they could use for their reading time?" Abigail discussed how her fellow teachers in the PLC shared resources: "Someone presents, and it could be . . . a website that someone found that has these short videos on it." Sharing new teaching tools within the PLC helps teachers gain new insights and understandings as educators (Penuel et al., 2007).

The participants also reorganized their ability to make their own decisions within the PLC. "There is nothing like two teachers getting together, by choice, working together, and coming up with stuff," Zachary observed. Laura also shared that "We've done anything from team building one week, communication . . . another week, student-directed [teaching] another week, [and] classroom management. I mean we can let the topic be whatever we wish." The participants discussed that having more autonomy within their PLCs gave them a platform to grow their knowledge. Teachers' decision-making authority regarding how they work in their PLCs helps promote professional learning (Helterbran, 2010).

Participants discussed not only the autonomy they had in organizing their work within their formal PLCs, but also discussed how they worked with teachers from their PLCs informally. Woodrow shared that

> We officially have to meet on Thursday morning for PLCs, but the three of us,
> 'cause we worked this out on purpose [our classrooms next to one another], . . .
> we can open the door and say, "Hey, this isn't working for me. What are you
> doing?"

Woodrow's PLC had a formalized meeting time and place; however, between those required meetings, his PLC worked together in an informal capacity. Betty's PLC also met outside of the formal meeting time while they were "eating lunch together, . . . bouncing ideas off each other, or when seeing someone in the hallway." For both Woodrow and Betty, informal PLC moments of collaboration showed that they could continually work with their group beyond the official allotted time. Indeed, teachers can greatly benefit from working together on a consistent basis through informal means (Borko, 1987; Conway, 2008).

Although the participants were positive about being part of a PLC, Herbert acknowledged that there was some "initial frustration" among the teachers when the district implemented mandatory PLCs. Herbert saw the mood shift when teachers appreciated that they were "getting a lot out of this." Even if meeting in a PLC at first had some struggles, he described his experience: "I'm leveraging my time; I'm getting a lot more out of it than I'm investing." Theodore also spoke about the benefits he observed in his PLC: "It's [the PLC has] been beneficial for us because we've been able to share ideas and see different points of view and see how different people run their classrooms." Abigail expressed her excitement: "I am the newer teacher who has bright eyes and says what are you [PLC members] going to show me?" Abigail enjoyed the opportunity to work and learn from other, more experienced teachers in order to grow as an educator. The participants in the present study perceived their involvement in a PLC as facilitating their growth as teachers. Indeed, teachers gain an appreciation for the time they are spending together because the collaborative nature of the PLC can profoundly impact student learning (DuFour, 2004; Penuel et al., 2007).

Department Chairperson Leadership

This typology described the participants' perceived role in providing leadership to their fellow colleagues and thus contributing to their colleagues' growth with regard to the development of their PCK. As department chairpersons, the participants were in positions of leadership and, therefore, had opportunities to work alongside and assist their colleagues (Feeney, 2009; Zepeda & Kuskamp, 2007).

In order to successfully assist their colleagues, the participants discussed the leadership approaches they used. Herbert discussed the role of encouragement in relating to his colleagues.

"My main focus right now is to help the teachers best leverage their time [by] not having to reinvent the wheel, [to] provide encouragement. I do a lot of encouragement." Herbert also discussed how he helped his colleagues grow as teachers without being perceived as negative.

> I normally wait until someone has [a] concern or a question. It's not in my position [to be an authority]. I'm not really in a situation where I would actually, proactively, make a suggestion. I do have ways to do that very subtly when I observe behaviors, say, a new teacher that would like to see improvement.

Franklin also discussed how he wanted his colleagues to know that he had their "best interest at heart." He did not want to be seen by his colleagues as someone telling them that "this is the way you ought to do it [teaching]." Franklin wanted to make sure that his fellow teachers knew that he cared about their success. If they felt secure in Franklin's leadership, he felt they would be more likely to listen to his suggestions. Zachary wanted to make certain that his colleagues saw him as someone who would help and not as someone who would disparage or degrade them. Zachary simply stated that "my opinion of being in charge of anything is you become the servant of everybody else." This type of leadership reflects servant leadership (Sergiovanni, 1992; Sergiovanni & Starratt, 2007). Servant leadership is leadership that does not define the needs of others, but yet allows those being served to define their own needs (Sergiovanni). Zachary clearly reflected this approach.

These statements indicate the importance that the participants placed on positively influencing their colleagues. They wanted to help their colleagues feel comfortable with their leadership style. Teacher leaders are people who see a problem and then set out to help solve it

(Helterbran, 2010). The participants wanted to be that teacher leader who works in a supportive role with department colleagues (York-Barr & Duke, 2004).

One such way that the participants assisted their colleagues' growth in PCK was by sharing what they learned from their own teaching experiences. Ronald commented, "My ideas are usually salient and to the point—stuff people can use because I've taught using most of the stuff already." Ronald displayed PCK by acknowledging that his suggestions were either ones he had actually experienced himself or, at the very least, the suggestions were ones that could be accomplished given the context of the particular school environment where he and his colleagues worked (Ball et al., 2008; Shulman, 1986). Betty added, "I help my other colleagues by sharing with them what worked with me and what did not work or, rather, what worked with my students and what did not." By reflecting on her own teaching successes, Betty showed that her teaching used reflection which is a significant component of PCK (Shulman, 1987). Betty positioned herself to help her colleagues foster their own PCK by learning from an experienced practitioner (Lee et al., 2007).

Other participants discussed similar approaches to helping colleagues. Herbert remarked, "I just use my little bit of experience that I have to share with other teachers." Theodore wanted to help his colleagues, as well, and felt that teachers needed to remain open to suggestions. He said:

> I am always willing to give an idea, to say, maybe try something this way as
> opposed to the way they [teachers] are having it. . . . Again I think that goes back
> [to] don't be stuck in your ways—be willing to adjust and be willing to adapt.

But also be willing to voice [speak out] and say, "Hey, you may be wanting to try

it this way and see what happens."

Herbert, Theodore, Betty, and Ronald all used their own experiences in order to help foster

growth among their colleagues (Lee et al., 2007). By sharing these experiences with fellow

teachers, the participants helped nurture the PCK growth of their colleagues (DuFour, 2004;

Gigante & Firestone, 2008). The participants, in their role as department chair, enhanced their

colleagues' understandings of teaching by providing examples and key ideas for them to use in

the classroom (Wettersten, 1992). Participants also shared how they conveyed the content in a

way that facilitated student learning. This type of sharing gave their colleagues examples of how

particular content could be transformed from simply content information into content designed

for students to understand it (Manouchehri, 1997). The more examples of effective teaching

shared with colleagues, the more likely they were to grow in their PCK (Lee et al., 2007).

Participants offered specific examples used to help their colleagues. Patricia discussed

how she assisted a specific colleague, one-on-one. "I try to share with him things and projects

and activities that he can do in the classroom." Ronald displayed leadership when he discussed

helping a fellow teacher expand her content knowledge: "[I] gave [the] colleague a book on

geology to help her understand better." Barbara described the leadership she provided as

"help[ing] other teachers as far as how to set up a unit, to where you do something, like do an

activity and break it down." Barbara, Ronald, and Patricia used their knowledge of content and

teaching to help their colleagues expand their PCK. Colleagues develop their PCK through

learning effective classroom activities and seeing how to construct lessons to facilitate student

learning (Shulman, 1986). As stated in the previous section, teachers learn from experienced

teachers which then contributes to the growth of their PCK (Gigante & Firestone, 2008; Lee et al., 2007).

Participants also discussed how they encouraged collaboration within their departments. For Herbert, "If you can, get everybody involved in being part of the team, and they all have a role to play. [Then] they feel needed and participate a lot better and we all get along a lot better." Herbert developed a system to encourage collaboration and participation among his colleagues. Within his department, some of his colleagues would become "the go-to-people for . . . [a] particular subject." This process meant that, within Herbert's mathematics department, fellow colleagues would take on leadership roles for each of the courses offered at the school. He then added that, within his department, he was "going to rotate that [lead position designation] around so that everybody gets a shot." Herbert not only gave his colleagues the opportunity to serve as leaders, but also ensured that his colleagues could be active members within the department. As the "go-to-people," Herbert's colleagues could develop their own PCK by becoming a leader and the point person of the department within their "particular subject." Their content knowledge and knowledge of the curriculum could grow which could further develop their PCK (Barrett & Green, 2009; Gigante & Firestone, 2008).

Though allowing fellow teachers to contribute to a department encourages the development of PCK, participants discussed some challenges associated with inclusion of their colleagues. Michelle reflected: "I'm always analyzing, because I have access to all of the data [reflecting student scores]. I have to, to be able to drive and advise the department. [However,] . . . learning to be collaborative in that function has been a real challenge. . . . You want to say this is how you do it, but you have to let them [fellow colleagues] come around and give their input."

Michelle initially thought that she could just tell her colleagues what to do, yet she learned the importance of allowing her fellow teachers to participate and share their perspectives regarding the analysis of student data and how to respond to those data. Department chairpersons must facilitate conversations within their department over the work (Campbell, Melville, & Barkley; Wettersten, 1992; York-Barr & Duke, 2004). Michelle's emphasis that teachers provide "input" regarding teaching decisions within an academic department reflects the connection between teachers' collaboration and the development of their PCK (Gigante & Firestone, 2008).

Abigail also discussed challenges she faced within her department; particularly during department meetings.

> If we're talking about apples, and I have someone start talking about oranges, and then, the juice in the oranges, I have to come in [and say], "Thank you very much, but I think such and such wants to say something." . . . We're talking about what we have to talk about. When we're done with what we have to talk about, if we have time left, we can talk about the oranges.

Abigail explained the challenge within meetings when teachers introduce a topic which may lead the department away from the topic on the agenda. She indicated how she would handle that particular situation by making it clear that the current meeting was focused on a specified topic and that, once finished and time permitting, the group could discuss the other topic. This statement reflects a major role of the department chairperson which is to organize and facilitate department meetings (Feeney, 2009). Teacher leaders focus on meetings running smoothly with discussion of topics having few interruptions (Campbell et al., 2012; Feeney, 2009).

Participants also discussed how their colleagues, both experienced and novice teachers, could help within the department. George described new teachers as having "something to offer, and, in fact, in terms of methods, they should be on the ball with recent teaching methods and teaching stuff." However, George did acknowledge that he "would hope the more experienced members of the department would be the ones with more to offer." A more experienced practitioner can contribute to a colleague's professional growth (e.g., Lee et al., 2007; Camburn; 2009). This point of view reflects the literature which acknowledges that both experienced teachers and novice teachers can contribute to collegial growth.

The participants also portrayed themselves as responsive to teachers expressing their problems and concerns. Laura described her efforts within her department meetings to be "more open [for] conversation, and, you know, if a teacher . . . is disgruntled about this or that, then myself or others are able to chime in with some sort of advice." Ronald recalled that teachers within his department had a "meltdown . . . due to EOC [End of Course Exams], and the DOE [Department of Education] was telling them what to teach, and it was creating all kinds of problems." However, Ronald acknowledged that he let his colleagues "vent" and then tried to "settle and calm things down." Zachary also reported that he interceded on issues expressed by teachers in his department. However, he admitted that sometimes "some of the stuff they want to talk about, they're not the most necessary, critical issues of the day. They are pettier, bickering type of things. Cutting off some of that [colleagues' issues] leaves them [the colleagues] in a better mood." The participants saw themselves as confidants for their colleagues which could aid them in earning the trust of their colleagues. As Franklin articulated, "if they [department members] feel very comfortable with talking with me, they're going to tell me the good, bad, and

ugly." Such a relationship can help build trust which is important for an academic department (Feeney, 2009). The development of more trust can lead to more collaboration, an important avenue for the growth of PCK among department members (Helterbran, 2010; York-Barr & Duke, 2004).

The participants also recognized that they could help teachers communicate with the administration regarding questions or concerns. Mary revealed that "when my teachers say that there's something they need or something they're missing, I go to bat for them." Betty declared, "I always tell my department that my job is to support them. So if they need something, come to me. If they have a concern, come to me. I will go to the administration." Betty added that she helped those "teachers who are afraid to speak up. They can shoot me an email. . . . I sometimes am a bridge between them and administration." Zachary referred to the department chairs as someone who could "take the battle" to the administration. He added that his administration's preference was to communicate about issues with the department chairperson "instead of having to deal with all 100 plus teachers." In order to help their colleagues, the participants, as department chairs, acted as intermediaries between the administration and the teachers (Feeney, 2009). Thus, their colleagues had an avenue to discuss their concerns more easily than if they had to consult an administrator for every question or concern (Kelley & Salisbury, 2013).

Though the participants discussed the importance of acting as a sympathetic ear for their colleagues and taking their concerns to the administration on their behalf, they also expressed the importance of advocating for their department members. Such advocacy occurred when the participants identified and took the necessary steps to help their colleagues (Helterbran, 2010). For example, Abigail said, "I have reached out to administration, to the county [instructional

coach], to the reading coach to go and assist the people that I feel need help. . . . So I do try to get them [my colleagues] help." She also stated, "I've had the county [instructional coach] come in. . . . I said, 'could you just see how things are going in there? Answer their questions. See what's going on.'" In order to assist her colleagues, Abigail reached out to support personnel within her district.

Woodrow also sought help when he was concerned about some members within his department who were to work with one another within a PLC. Woodrow recognized that these two teachers were "not going to be productive" working together. So, Woodrow "went to the administrator and said, 'this ain't going to work. Can we do such and such?'" Recognizing a problem pertaining to teachers working together within his department, Woodrow went to the administration in order to find a solution. Such forward thinking and action are what teacher leaders do. As Helterbran (2010) suggested, teacher leaders recognize a problem and then take the needed steps in order to address it.

In addition to these examples of department chairs seeking help for their colleagues, other participants revealed how they directly helped the teachers in their departments. An example from Patricia was that within her department the teachers were too often taken out of their own classes in order to proctor high-stakes exams for the school. "I felt that I needed to speak out because of my whole department. The majority of the people were put in the position of test administrator, and I was kind of concerned about that." Patricia's account showed that she advocated for her department when she realized that they were being treated unfairly. As an advocate for her department, Patricia described how her efforts helped build trust among her department colleagues.

Jacqueline assisted her department differently. She made sure her department was not inundated with useless classroom materials. "I'm sort of that first exposure for the social studies materials. . . . It comes to me first, as it should, I believe. Then I can filter out what's crap." She recognized that department chairpersons understand the range of content taught (Zepeda & Kuskamp, 2007) and, therefore, can distribute materials that arrive at the school to those teachers who can use them (Feeney, 2009). Such management tasks contribute to a smoothly operating department.

The participants in the present study took their leadership role as department chairperson seriously. They described how they helped their colleagues by fostering collaboration and contributing to their colleagues' PCK growth. Also, the participants explained how they displayed leadership by listening to the concerns of their colleagues, by being the intermediary between the teachers and the administration, and, ultimately, by stepping in when they saw a problem and taking steps toward solving it (Helterbran, 2010).

This section presented both the description and analysis of the data collected in the present study. Description and interpretation are two of the four dimensions of Eisner's (1998) educational criticism, an approach to data analysis in qualitative inquiry and qualitative research. Hatch's (2002) typological analysis served to identify and organize the categories used in describing and interpreting the data. The next section describers the third dimension of Eisner's educational criticism, evaluation.

Evaluation

Evaluation is the third dimension in Eisner's process of educational criticism (1998), the overall framework guiding data analysis in the present study. Description, the first dimension,

focused on describing participants' data. Interpretation, the second dimension, focused on the meaning embedded within the data provided the participants. In many cases, the professional literature provided lenses through which the data could be understood. As the third dimension in educational criticism, evaluation requires the consideration of value in the data, that is, whether what is described and interpreted has merit (Eisner, 1998), in this case whether what the participants shared has value with regard to student learning. Building on Dewey's (1938) description of educative, non-educative, and miseducative learning experiences for students, Eisner argued that the researcher must attend to similar concerns with regard to the data which are analyzed.

In the present study, the task was to describe and interpret the data with regard to department chairs' understanding of PCK as it related to their efforts to foster student achievement. Description and interpretation of the data also reflected the participants' role in their colleagues' growth in PCK and, in turn, the relationships between such collegial growth and collegial efforts to foster student achievement. A critical foundation for department chairs' leadership in facilitating the PCK growth of their colleagues' PCK was their own use of and growth in PCK. Analysis of the data thus far supports the argument that participants' perceptions of their own teaching practice reflected clear understanding of the role of PCK in furthering student achievement. Thus, the data lead to a view of their teaching practice as reflecting educative ends. With such a foundation as part of their professional perspective, these department chairs encouraged their colleagues to also examine their teaching practices in terms of their enactment of PCK. Indeed, participants' perceptions revealed an educative stance with regard to student achievement facilitated by PCK.

This section evaluated the participant data as part of Eisner's third dimension of educational criticism. The next section includes a discussion of the fourth dimension of educational criticism, thematics.

Thematics

The fourth dimension used to analyze the data were thematics (Eisner, 1998). This dimension of educational criticism refers to the themes developed from analysis of the data. These themes, then, are used in understanding other situations through naturalistic generalization. Naturalistic generalization involves using themes developed from the particulars of the data to generate understanding within subsequent situations that arise. The themes "provide clues or cues to the perceptions of other situations like the situation from which the themes were extracted" (Eisner, p. 104) in order to increase understanding.

For the present study, three main themes were developed related to teacher leadership and PCK: (a) These department chairpersons can lead as teachers without formal authority; (b) These experienced teachers in leadership positions possessed key elements of PCK; and (c) These teacher leaders brought their tacit PCK into the explicit in order to facilitate collegial growth. The following three sections discuss each of the three themes.

Department Chairs can Lead as Teachers.

The participants served in the dual role of department chair and teacher. As department chairs, the participants had a titular title, assumed additional responsibilities, and yet did not possess any administrative authority with regard to the operation of their departments. In spite of not having formal authority, the participants described leadership as facilitating departmental daily operations, facilitating departmental meetings, and acting as liaisons between the

administration and teachers (Feeney, 2009). However, participants' responses indicated, that while serving as department chairs, their main goal was to help their colleagues grow together within a professional learning community.

They developed much of this leadership from their own teaching. Taking their understanding of teaching and then sharing it with their colleagues was an important aspect of how these participants assisted their fellow colleagues (Borko, 1987). For example, Betty explained, "I help my other colleagues by sharing with them what worked with me and what did not work." Ronald echoed Betty's sentiments by stating that his "ideas are usually salient . . . because I've taught using most of the stuff already." Both Ronald and Betty used what they learned from their teaching and referred to it in helping their colleagues within their departments. Through the use of their own teaching, the participants led their colleagues by sharing experiences from their own teaching.

Herbert described another example. He wanted his colleagues to collaborate. "If you can, get everybody involved in being part of the team, and they all have a role to play, . . . [teachers] feel needed and participate a lot better . . . [and] get along a lot better." Herbert understood that in order for teachers to collaborate, he needed to provide teachers with roles so that they could actually take ownership of the work. He saw leadership in a content area as a means to gain more content and curricular understanding. Therefore, he wanted to encourage his colleagues to take on leadership roles within the department to experience similar benefits as he had experienced. Thus, the work of the department was shared. However, more importantly, his colleagues were given roles which would encourage teacher learning and collaboration within the department (Kelley & Salisbury, 2013).

Experienced Teachers in Leadership Positions Possess Key Elements of PCK.

The data provided evidence that the participants, who all served as department chairpersons, exhibited well-developed PCK. Each of the participants was an experienced teacher, with five teachers having 4 to 11 years of experience, five teachers with 12 to 17 years of experience, and five teachers with 18 to 27 years of experience. Each participant described using elements of PCK in his or her teaching practice.

The participants understood the complex nature of teaching in order to help students learn. They reported using the knowledge gained from their prior teaching experience to help them improve their own practice. They also discussed using their expanding knowledge of content to help enrich their teaching. In addition, the participants emphasized the various pedagogical techniques they employed in their classes along with their content knowledge to promote student learning. In so doing, they appreciated the necessity of attending to both pedagogy and content and how these two foci interrelated in their teaching practice. Thus, they demonstrated what the literature supports (e.g., Shulman, 1986), that knowledge of both of content and pedagogy are necessary to become an effective teacher.

Through the use of their experience and knowledge of the field in which they taught, the participants gave examples as to how they understood PCK operating in different teaching environments. Also, they were able to discuss the context in which they used their PCK. Participants understood that the school structure and the types of students they taught influenced their teaching (Frykholm & Glasson, 2005).

Participants also discussed ways in which they expanded their PCK. Professional development was among the typologies that the participants described as contributing to their

growth in teaching practices. Participants described attending institutes dedicated to both pedagogy and to content. They also stated that they learned from their colleagues in the PLCs established at their schools.

Teacher Leaders Bring Their Tacit PCK into the Explicit.

The final theme represented how the participants used their knowledge of PCK in their interactions with colleagues. In order for teachers to promote PCK growth among their colleagues, they must have well-developed PCK and must be able to share that with their colleagues. From the standpoint of educational criticism (Eisner, 1998), the leaders were taking their own connoisseurship of PCK and making it public. That is, this public framing of their knowledge became explicit and, thus, useful to others.

Although participants did not use the term Pedagogical Content Knowledge or PCK, they reported using their PCK themselves to help their students learn. Participants also described how teachers learned from one another. Each participant stated that a significant factor when teachers learn from each other is their sharing of effective practices and experiences with their colleagues. Participant statements indicated that they used their effective methods from their classes, as well as their own experiences, to help colleagues develop in their teaching. Thus, their sharing with colleagues made their PCK public.

Fundamentally, growth in PCK promotes student learning. In addition, PCK may contribute to solving instructional problems. Because the mark of a teacher leader hinges on seeing a problem and setting out to solve it (Helterbran, 2010), these participants made public their PCK in order to assist their colleagues in fostering student learning.

Chapter Summary

This chapter discussed how the researcher used Eisner's (1998) educational criticism and Hatch's (2002) typological approaches to analyze the data. Initially, six different typologies were developed in order to organize the description and interpretation of the data. The categories used were:

- How Participants Understood and Defined PCK,

- Knowledge of Context within Pedagogical Content Knowledge,

- Participants' Understanding of the Importance of Content Knowledge,

- Growth of the Teacher,

- Professional Learning Communities,

- and Department Chairperson Leadership.

The data were then evaluated in reference to how department chairs perceived their role in promoting PCK in order to foster student learning. That is, were their efforts connected to furthering student learning, having no effect on student learning, or impeding student learning, or as Dewey (1938) expressed it, educative, noneducative, or miseducative? Overall, their work as department chairs supported student achievement through their focus on PCK. Finally, three themes were developed from the data:

- Experienced teachers in leadership positions possess key elements of PCK.

- Department chairs can lead as teachers.

- Teacher leaders bring their tacit PCK into the explicit.

These themes reflected "recurring messages" within the data (Eisner, 1998, p. 104).

The next chapter includes summaries for Chapter One through Chapter Four, along with a

discussion of the limitations of the present study, implications for educational leadership,

recommendations for further research, and conclusions regarding the present study.

Chapter 5: SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

Within the practice of educating students, the primary and most important purpose is to help students learn. To do so has been a major source of concern for educators. In 1986, Lee S. Shulman articulated the notion of Pedagogical Content Knowledge, or PCK. He stated that a teacher would be best able to help students learn by both knowing the content which they taught and possessing the ability to use effective pedagogy to help students comprehend the content. For Shulman, both pedagogy and content knowledge worked together in order to help teachers meet students' educational needs.

As important as Shulman's concept of PCK is, how teachers develop their PCK is also important. Many teachers initially develop their PCK as part of a preservice education program in a collegiate environment. While in preservice education, the individual takes classes in pedagogy, content, and subject-area methodology, e.g. social studies methods courses. Once hired in a teaching position, many educators enhance their PCK through professional development opportunities. These opportunities may be offered by the school district, may be developed within the school where they work, or may take the form of self-directed professional development experiences such as attending a workshop focused on specific content or pedagogy. Yet another way in which educators expand their PCK is through interaction with other educators. This type of PCK growth can take place through teacher-to-teacher relationships. These relationships can occur within professional learning communities, or PLCs, within a mentor-mentee relationship, or through interaction with teacher leaders. Teachers as leaders can

either have formal recognition with a title or be seen as leaders by their colleagues. One such teacher leader with a formal role is the department chair who has the opportunity to help expand colleagues' PCK.

The present study addressed the following research question: How do department chairpersons understand PCK and perceive their role in promoting the PCK growth of their colleagues and within their departments? The position of secondary-school department chairperson is a difficult one. The department chairperson must lead a group a teachers through organizing an academic department, holding meetings, and serving as an intermediary or liaison between the administration and teachers. In addition to these functionary roles, the department chairperson also seeks to be a guide and advisor to departmental colleagues, along with continuing to teach a full course load. The department chairperson must navigate through all of these roles in order to be an effective leader (Feeney, 2009).

The significance of the present study lies in understanding how department chairs develop their own PCK and how they help their colleagues develop their PCK to further student learning. Such knowledge can inform the profession and thus lead to increased opportunities to support teacher growth in PCK.

The theoretical framework guiding the study included several points. This framework consisted of the following assertions based on the literature:

- Teachers who have pedagogical content knowledge contribute to student learning;

- Teachers can be leaders in their schools;

- Department chairpersons are one type of teacher leader;

- Teacher leaders can contribute to colleagues' professional growth;

- Teacher leaders can contribute to colleagues' professional growth in PCK; and

- Development of PCK results from both the individual professional efforts of

teachers and their interactions with colleagues, both informally and formally.

This theoretical framework helped establish the rationale for the study which sought to

understand how department chairpersons perceived PCK. It also guided the development of the

interview protocol that was used in data collection.

The remainder of this chapter is divided into seven sections. The next section

summarizes the review of the literature. Following that is a description of the research design

and the specific methodology used in data collection. A description of data analysis follows,

including the processes followed and what knowledge resulted. The chapter also includes the

limitations of the study, the implications from the study for leadership, and recommendations for

future research. The final section concludes the study.

Summary of Literature Review and Conceptual Framework

The review of literature related to the theoretical framework for the study and the main

concepts embedded in the research question. Thus, it described how PCK is defined, how

teachers acquire PCK, and how teacher leaders could promote PCK in their departments.

Lee S. Shulman (1986) was the first person to name the concept of pedagogical content

knowledge, a blending of content and pedagogy by teachers as they work to help students learn.

Shulman, however, was not the only person to think of teaching in this fashion. In 1969, Joseph

Schwab discussed the necessity for teachers to understand their discipline and its structure and to

understand how the different disciplines require different criteria while developing curricula to

promote student learning. Schwab used the example of science to make the claim that a teacher

needed to possess different types of knowledge when teaching chemistry as opposed to biology and to consider those differences from a pedagogical perspective.

Moving beyond Schwab (1969), however, Shulman (1987) discussed how the knowledge of teaching expanded well beyond content mastery. For example, Shulman discussed the notion of understanding not only the curriculum a teacher was teaching but also the vertical curriculum, that is, what was taught to students previously and what students would encounter later in their schooling. Shulman also recommended that teachers of a given subject area should be familiar with the horizontal curriculum, the other subject areas students encounter simultaneously within the same school year. Shulman also emphasized the necessity for teachers to reflect on their teaching in order to address what was successful and what needed adjustment so that they could grow in their practice.

Years after Shulman established the notion of PCK, Ball, Thames and Phelps (2008) developed the notion that PCK included consideration of educational contexts, such as school and student characteristics. Awareness of these characteristics help teachers tailor their instruction to assist their students in learning.

The review of the literature also included a focus on how teachers grow professionally in terms of their PCK. First, many teachers begin to develop their PCK within their preservice educational experiences. Preservice teachers take courses dedicated to both content and methodology. The coursework that preservice teachers take in order to develop their content knowledge helps them become more proficient in PCK because they are more knowledgeable in the field where they will be teaching (Even, 1993; Graeber, 1999; Piccolo, 2008; Shulman, 1986). Preservice teachers also take coursework focusing on pedagogy, both general methods

and methods specific to a particular content area. Preservice teachers' participation in

internships with practitioners in the teaching field also contributes to their growth in PCK (Boz

& Boz 2008; Doppen, 2007).

Practicing teachers enhance their PCK through professional development opportunities.

Such professional development includes graduate courses, in-service workshops, curriculum

development opportunities, and self-initiated independent learning. For example, Anderson and

Hoffmeister (2007) found that teachers who engaged in content-rich professional development

were consistently thinking about how they could incorporate new content information into their

classroom practice. The participants' reflection on what they learned and how they would use

this new information is evidence that professional development can enhance PCK in teachers

(Shulman, 1987; Manouchehri, 1997).

The literature review also included discussion of teacher leadership and how teacher

leaders can promote colleagues' growth in teaching. Leadership among teachers occurs in

numerous ways within a school (York-Barr & Duke, 2004). Teachers learn from each other

through both informal and formal methods. Informally, a teacher may lead a colleague by

simply discussing a situation in the hall between classes. Teacher leaders can also focus on a

problem and then work with colleagues to help solve it (Helterbran, 2010).

Teacher leaders of various types can contribute to growth among their colleagues.

Teachers do not need a formal title to be teacher leaders (Patterson & Patterson, 2004), but they

can hold formal titles such as mentor, instructional coach, or department chair. Formally, a

teacher may hold a specific leadership position where he or she organizes and facilitates

meetings dedicated to helping colleagues. Thus, informal and formal forms of teacher leadership

can influence how teacher leaders with well-developed PCK can influence colleagues'

professional growth in PCK (Gigante & Firestone, 2008).

The review of literature yielded a conceptual framework that guided the present study.

This framework included how department chairs enhance their PCK through preservice

education, professional development opportunities, and interactions with their colleagues. The

framework also highlighted how content knowledge and pedagogical knowledge blend within

teaching practices. The framework thus outlined the focus of the study, that is, how department

chairs understood PCK and how they perceived helping colleagues develop their PCK to

facilitate student learning.

This section discussed the review of the literature and the conceptual framework that

guided the present study. The next section provides a summary of the research design and data

collection methodology.

Summary of Research Design and Data-Collection Methodology

To understand how department chairs perceived their role in facilitating the growth of

their colleagues' PCK, a qualitative research design was used that would enable them to discuss

their perspectives. Therefore, the research design employed in-depth, semi-structured interviews

(Marshall & Rossman, 2006; Patton, 2002; Spradley, 1979). Participants were department chairs

in secondary schools. A school district in the Southeastern part of the United States was used for

the research study that had diverse students from different socio-economic backgrounds and with

schools in urban, suburban, and rural areas (Federal Education Budget Project, 2012). Once

permission was received from the district in which the study was to be conducted and from the

University of North Florida Institutional Review Board, each secondary-school department chair

was sent a letter of invitation (see Appendix B). All department chairs who volunteered to participate were interviewed. Participants received an informed consent form which they signed before the interviews began (see Appendix C).

The development of the interview questions (see Appendix A) followed the recommendations of Kvale (1996), Spradley (1979), and Patton (2002). Interview data were collected over a period of three months in 2015 from 15 secondary-school department chairs in one school district in the southeastern United States. The data were placed on a password-protected, secure server. Several procedures were employed to contribute to the credibility of the study: transparency with regard to the development of the interview protocol, verbatim transcription of the interviews, and participants' review of their transcripts for accuracy. Such a procedure contributed to the credibility of the study.

This section summarized the research design and data-collection methodology. The next section provides a summary of both the processes for and the results of data analysis.

Summary of Data Analysis

This section summarizes both the data analysis processes followed and the results of those efforts. Data analysis employed educational criticism (Eisner, 1998) as its overall framework, along with Hatch's (2002) typological analysis supporting the description dimension of educational criticism. Educational criticism involves four dimensions: description, interpretation, evaluation, and thematics. The two dimensions of description and interpretation were discussed together, inasmuch as the data themselves were participants' perceptions or interpretations of their own teaching and leadership practice with regard to PCK. Referencing

the literature to interpret their perceptions, as they described and understood them, seemed unavoidable.

Hatch's (2002) typological analysis facilitated description of the data. After reading the data several times and noting key concepts within the data, six typologies were identified to organize the description of the data. Categories chosen for description were the following: How Participants Understood and Defined PCK, Knowledge of Context within PCK, Participants' Understanding of the Importance of Content Knowledge, Growth of the Teacher, Professional Learning Communities, and Department Chairperson Leadership. The participants used teaching methods that were congruent to having well-developed PCK. Participants also reported that they worked to assist their colleagues' growth. The data indicated that the participants valued teacher-to-teacher collaboration in order to help students learn. They also indicated that during these collaborative moments, teachers were able to learn from each other. As department chairs, the participants discussed the role they played in helping their colleagues and encouraging their colleagues to work together. In so doing they fostered their colleagues' growth in PCK.

Eisner's (1998) third dimension of educational criticism is evaluation. Evaluation as a process examines how the data collected from the participants' reflect educative, noneducative, or miseducative purposes for education. Given that the literature regarding PCK connects teachers' PCK with increased student learning (Shulman, 1986, 1987) and that these department chairs' perceptions that their teaching practice and relationships with colleagues reflected a focus on PCK, the data represent educative professional practice.

Eisner's (1998) fourth dimension of educational criticism is thematics. Here the "recurring messages" (Eisner, p. 104) are identified so that naturalistic generalization to other situations is

possible. The themes embedded in the present study included: Experienced teachers in

leadership positions possess key elements of PCK; department chairs can lead as teachers; and

teacher leaders bring their tacit PCK into the explicit. The present study also had limitations that

are discussed in the next section.

Limitations of the Study

The present study focused on a specific research question, that is, how do department

chairpersons understand PCK and perceive their role in promoting the PCK growth of their

colleagues and within their departments. In so doing, the knowledge that resulted from the study

reflects certain limitations.

First, the only data collected were participants' perceptions of their teaching and

leadership practices with regard to PCK as shared in the context of semi-structured, in-depth

interviews. Knowing what the participants shared (Patton, 2002) does not necessarily represent

what they did in their teaching and leadership practices. Observations of participants' practices

did not occur, nor were evaluations of their performance by administrators consulted. Thus, the

data were only perceptions of individuals of their own practice as teachers and teacher leaders

with regard to PCK.

A second limitation of the present study acknowledges that the participants were teacher

leaders in only one school district in one part of the United States. Though the department chairs

represented the breadth of subject areas taught in secondary-schools, the participants worked in

only one particular district. Teacher leaders in other school districts or in other parts of the

United States may enact their practice with regard to PCK differently, depending on different

demographic characteristics and different institutional and policy demands. Indeed, although the

knowledge base regarding the role of PCK in secondary department chairs' teaching and leadership practices within one school district has been enhanced, much more needs to be known.

The final limitation reflects the focus of the present study on only one group of teacher leaders, secondary-school department chairs, in reference to their understanding of their own PCK and of how they perceived they worked with colleagues in developing their PCK. However, other teacher leaders within schools, from elementary schools to mentors and even informal teacher leaders, understand and have knowledge of PCK. Their perceptions of their practice could also contribute to our knowledge base.

The next section describes implications for educational leadership suggested by the present study.

Implications for Educational Leadership

Department chairpersons can offer guidance and help with regard to their colleagues' growth in PCK. Further, their role allows them to share responsibilities with colleagues which in turn can facilitate growth in PCK. They can do so through the development of professional learning communities (PLCs) to further a climate leading to growth in PCK and, ultimately, to increased student learning. School district leadership, as well as school-based administrators, must recognize and actively support the important role that department chairs play in the professional growth of secondary-school faculty.

The present study recognized that these department chairs implicitly understood the role of PCK in their own teaching and promoted the use of PCK among their colleagues. However, explicitly focusing on the concept of PCK and its supporting theory and research would deepen

their understanding and that of their colleagues. Thus, an implication would involve professional development specifically focusing on PCK and how PCK furthers student learning.

A third implication relates to leadership in schools. Based on the present study, the role of department chair matters in the leadership of a department. Schools should take advantage of the leadership offered by department chairs (Sergiovanni & Starratt, 2007). Department chairs need support from their school and district administrators as they strive to promote good teaching with their colleagues. Such support would broaden the leadership base in schools as they endeavor to improve student learning.

The next section offers recommendations for further research.

Recommendations for Further Research

Further research regarding department chairs' understanding of PCK in their own teaching practice and in their work with colleagues would help inform scholars, researchers, and school-based educators on the impact department chairpersons play in the development of their colleagues' PCK. Such research could contribute to increased understanding of how PCK could be directly developed and supported for increased student learning.

One such recommendation would focus on how secondary-school department chairs actually work with colleagues to develop PCK in order to facilitate student learning. Such research would involve observations of department chairs working with their colleagues in one-on-one settings, in a classroom setting with a colleague, and in formal department meetings. Another recommendation for further research would involve interviewing department members regarding their understanding of PCK and how interaction with their department chairs

contributed to the development of their PCK. Such a study would provide additional knowledge regarding the relationship between department chairs and their colleagues.

Yet another recommendation for further research would be to investigate how department chairs in other school districts with different demographics understand the role of PCK in their own teaching and how they interact with colleagues in their development of PCK. Such research would recognize how the environment and the culture of schools influence the development of PCK in different ways.

Another recommendation for further research could focus on comparing the PCK of department chairs during their first three years in the position with that of department chairs who have served for over three years, along with comparing how these chairs might interact with colleagues differently with regard to using PCK to further student learning. Such research could reveal how department chairs grow in their understanding of PCK and how they develop leadership capacity in order to foster their colleagues' PCK growth.

Conclusion

The present study revealed that these department chairs possessed solid understanding of PCK. They then used that understanding in their interactions with fellow teachers. Although the department chairs did not name the concept of PCK, they did demonstrate implicit understanding of the concept which they shared with colleagues to facilitate student learning. Support of such faculty efforts by school-level and district-level administrators through rich professional development opportunities would deepen the use of PCK to benefit the long-term growth of students.

Chapter Summary

The final chapter summarized the background for the research question, the theoretical framework, the literature related to the study, and the methodology used in the study. The chapter also included a summary of the processes used in data analysis, a summary of the results of those efforts, and the major themes evident in the data. The chapter closed with discussion of the limitations of the study, implications for educational leadership arising from the study, recommendations for future research, and a major conclusion for the study as a whole.

REFERENCES

Anderson, C. R., & Hoffmeister, A. M. (2007). Knowing and teaching middle school mathematics: A professional development course for in-service teachers. *School Science and Mathematics, 107*(5), 193-203. doi:10.1111/j.1949-8594.2007.tb17783.x

Ball, D. L., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education, 59*(5), 389-407. doi:10.1177/0022487108324554

Bailey, L. B. (2010). The impact of sustained, standards-based professional learning on second and third grade teachers' content and pedagogical knowledge in integrated mathematics. *Early Childhood Education Journal, 38*(2), 123-132.

Barrett, D. & Green, K. (2009) Pedagogical content knowledge as a foundation for an interdisciplinary graduate program. *Science Educator, 18*(1), 17-28. Retrieved from http://www.nsela.org/images/stories/scienceeducator/18article2.pdf

Bean, R. M., Swan, A. L, & Knaub, R. (2003). Reading specialists in schools with exemplary reading programs: Functional, versatile, and prepared. *The Reading Teacher*, *56*, 446-455.

Berliner, D. (1991). Educational psychology and pedagogical expertise: New findings and new opportunities for thinking about training. *Educational Psychologist, 26*(2), 145-155.

Benton, B., & Benton, D. (2008). Professional development with a focus. *The Delta Kappa Gamma Bulletin, 74*(4), 24-28. Retrieved from

http://ehis.ebscohost.com/eds/pdfviewer/pdfviewer?vid=52&sid=e3af39e2-8203-4012-a548-35ff0ff7d186%40sessionmgr115&hid=110

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational Researcher, 33*(8), 3-15.

Boz, N., & Boz, Y. (2008). A qualitative case study of prospective chemistry teachers' knowledge about instructional strategies: Introducing particulate theory. *Journal of Science Teacher Education*, *19*(2), 135-156. doi:10.1007/s10972-007-90087-y

Bullough, R. V. (2000). Pedagogical content knowledge circa 1907 and 1987: A study in the history of an idea. *Teaching and Teacher Education, 17*(6), 655-666. doi:10.1016/s0742-051x(01)00022-1

Camburn, E. M. (2009). Allocating more experienced teachers to leadership positions in schools: A double-edged sword? *Journal of School Leadership, 19*(6), 680-696. Retrieved from http://www.rowman.com/page/jsl

Chval, K., Arbough, F., Lannin, J., van Garderen, D., Cummings, L., Estapa, A., & Huey, M. (2010). The transition from experienced teacher to mathematics coach: Establishing a new identity. *Elementary School Journal, 111*(1), 191-216.

Coenders, F., Terlouw, C., Dijkstra, S., & Pieters, J. (2010). The effects of the design and development of a chemistry curriculum reform on teachers' professional growth: A case study. *Journal of Science Teacher Education, 21*(5), 535-557. doi.10.1007/s10972-010-9194-z

Darling-Hammond, L. (1999). Educating teachers: The academy's greatest failure or its most important future? *Academe*, *85*(1), 26-33.

Dawkins, K. R., Dickerson, D. L., McKinney, S. E., & Butler, S. (2008). Teaching density to middle school students: Preservice science teachers' content knowledge and pedagogical practices. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 82*(1), 21-26. doi.10.3200/tchs.82.1.21-26

Dall'Alba, G., & Sandberg, J. (2006). Unveiling professional development: A critical review of stage models. *Review of Educational Research, 76*(3), 383-412. doi.10.3102/00346543076003383

Dewey, J. (1938). *Experience and Education*. New York, NY: Macmillan.

Doppen, F. (2007). The influence of a teacher preparation program on preservice social studies teachers' beliefs: A case study. *Journal of Social Studies Research, 31*(1), 54-64. Retrieved from http://ehis.ebscohost.com/eds/pdfviewer/pdfviewer?vid=11&sid=e3af39e2-8203-4012-a548-35ff0ff7d186%40sessionmgr115&hid=110

Dufour, R. (2004). What is a professional learning community? *Educational Leadership, 61*(8), 6-11.

Ediger, M. (2011). Mentoring in the social studies. *College Student Journal, 45*(2), 233-237.

Eisner, E. W. (1998). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. Upper Saddle, NJ: Prentice Hall.

Even, R. (1993). Subject-matter knowledge and pedagogical content knowledge: Prospective secondary teachers and the function concept. *Journal for Research in Mathematics Education, 24*(2), 94-116. Retrieved from http://www.jstor.org/stable/749215

Feeney, E. J. (2009). Taking a look at a school's leadership capacity: The role and function of high school department chairs. *The Clearing House, 82*(5), 212-218. doi:10.3200/TCHS.82.5.212-219

Frykholm, J., & Glasson, G. (2005). Connecting science and mathematics instruction: Pedagogical context knowledge for teachers. *School Science and Mathematics*, *105*(3), 127-141. doi:10.1111/j.1949-8594.2005.tb18047.x

Geddis, A. N. (1993). Transforming subject-matter knowledge: The role of pedagogical content knowledge in learning to reflect on teaching. *International Journal of Science Education, 15,* 673-683. doi:10.1080/0950069930150605

Gigante, N. A., & Firestone, W. A. (2008). Administrative support and teacher leadership in schools implementing reform. *Journal of Educational Administration, 46*(3), 302-331. doi:10.1108/09578230810869266

Graham, K. J., & Fennell, F. (2001). Principles and standards for school mathematics and teacher education: Preparing and empowering teachers. *School Science and Mathematics, 101*(6), 319-327. doi:10.1111/j.1949-8594.2001.tb17963.x

Graeber, A. (1999). Forms of knowing mathematics: What preservice teachers should learn. *Educational Studies in Mathematics, 38*(1), 189-208.

Greenes, C. (2009). Mathematics learning and knowing: A cognitive process. *Journal of Education, 189*(3), 55-64.

Grossman, P., & Thompson, C. (2004). Learning from curriculum materials: Scaffolds for new teachers? *Teaching and Teacher Education, 24*(8), 2014-2026. doi:10.1016/j.tate.2008.05.002

Gutstein, E. (2003). Teaching and learning mathematics for social justice in an urban, Latino school. *Journal for Research in Mathematics Education, 34*(1), 37-73.

Hatch, J. A. (2002). *Doing qualitative research in education setting*s. Albany, NY: State University of New York Press.

Helterbran, V. R. (2010). Teacher leadership: Overcoming "I am just a teacher" syndrome. *Education, 131*(2), 363-371. Retrieved from http://www.projectinnovation.biz/education_2006.html

Hemler, D., & Repine, T. (2006). Teachers doing science: An authentic geology research experience for teachers. *Journal of Geoscience Education, 54*(2), 93-102.

Hofstein, A., Carmeli, M., & Shore, R. (2004). The professional development of high school chemistry coordinators. *Journal of Science Teacher Education, 15*(1), 3-24. doi:10.1080/09500690701854840

Horn, I. (2009, September). *The development of pedagogical content knowledge in collaborative high school teacher communities*. Paper presented at the Annual Meeting of Psychology in Mathematics Education, Atlanta, GA.

Howe, K., & Eisenhart, M. (1990). Standards for qualitative (and quantitative) research: A prolegomenon. *Educational Researcher*, *19*(4), 2-9.

Huntley, M., & Flores, A. (2010). A history of mathematics course to develop prospective secondary mathematics teachers' knowledge for teaching. *Primus: Problems, Resources, and Issues in Mathematics Undergraduate Studies, 20*(7), 603-16. doi:10.180/10511970902800

Kahne, J., & Westheimer, J. (2000). A pedagogy of collective action and reflection: Preparing teachers for collective school leadership. *Journal of Teacher Education, 51*(5), 372-383. doi: 10.1177/0022487100051005005

Kelley, C., & Salisbury, J. (2013). Defining and activating the role of department chair as instructional leader. *Journal of School Leadership*, *23*(2), 287-323.

Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.

Lee, E., Brown, M. N., Luft, J. A., & Roehrig, G. H. (2007). Assessing beginning secondary science teachers' PCK: Pilot year results. *School Science & Mathematics, 107*(2), 680-696. doi:10.1111/j.1949-8594.2007.tb17768.x

Lieberman, A. & Miller, L. (2011). Learning communities: The starting point for professional learning is in schools and classroom. *Journal of Staff Development, 32*(4), 16-20. Retrieved from http://www.learningforward.org/news/jsd/index.cfn

Lowery, N. V. (2002). Construction of teacher knowledge in context: Preparing elementary teachers to teach mathematics and science. *School Science and Mathematics, 102*(2), 68-83. doi:10.1111/j.1949-8594.2002.tb17896.x

Manouchehri, A. (1997). School mathematics reform: Implications for mathematics teacher preparation. *Journal of Teacher Education, 48*(3), 197-209. doi:10.1177/0022487197048003005

Marshall, C., & Rossman, G. B. (2006). *Designing qualitative research* (4th ed.). Thousand Oaks, CA: Sage.

Monte-Sano, C. (2011). Learning to open up history for students: Preservice teachers' emerging

pedagogical content knowledge. *Journal of Teacher Education, 62*(3), 260-272.

doi:10.117710022487110397842

Patel, N., Franco, S., Miura, Y., & Boyd, B. (2012). Including curriculum focus in mathematics

development for middle-school mathematics teachers. *School Science and Mathematics,*

112(5), 300-309. doi:10.1111/j.1949-8594.2012.00146.x

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks,

CA: Sage.

Penuel, W. R., Fishman, B. J., Yamaguchi, R., & Gallagher, L. (2007). What makes professional

development effective? Strategies that foster curriculum implementation. *American*

Educational Research Journal, 44(4), 921-958. doi:10.3102/0002831207308221

Piccolo, D. (2008). Views of content and pedagogical knowledges for teaching mathematics.

School Science and Mathematics, 108(2), 46-48. doi:10.1111/j.1949-

8594.2008.tb17803.x

Rushton, G., Lotter, C., & Singer, J. (2011). Chemistry teachers' emerging expertise in inquiry

teaching: The effect of a professional development model on beliefs and practice. *Journal*

of Science Teacher Education, 22(1), 23-52. doi:10.1007/s10972-010-9224-x

Schempp, P. (1995). Learning on the job: An analysis of the acquisition of a teacher's

knowledge. *Journal of Research and Development in Education, 28*(4), 237-247.

Schwab, J. (1969). The concept of the structure of a discipline. In M. Feldman & E. Seifman

(Eds.), *The social studies: Structure, models, and strategies* (pp. 4-12). Englewood Cliffs,

NJ: Prentice-Hall.

Sergiovanni, T. J. (1992). *Moral leadership: Getting to the heart of school improvement*. San

      Francisco, CA: Jossey-Bass.

Sergiovanni, T. J., & Starratt, R. J. (2007). *Supervision: A redefinition* (8th ed.). Boston, MA:

      McGraw-Hill.

Spradley, J. P. (1979). *The ethnographic interview*. New York, NY: Holt, Rinehart & Winston.

Shulman, L. S., (1986). Those who understand: Knowledge growth in teaching. *Educational*

      Researcher, 15(2), 4-14. Retrieved from http://www.jstor.org/stable/pdfplus/1175860.pdf

Shulman, L. S., (1987). Knowledge of teaching: Foundations of the new reform. *Harvard*

      Educational Review, 57, 1-22. Retrieved from

      http://ehis.ebscohost.com/eds/detail?sid=a18581cf-7d1e-4642-8273-

      a2073bceef22%40sessionmgr112&vid=3&hid=110

Van Driel, J. H., & Berry, A. (2012). Teacher professional development focusing on pedagogical

      content knowledge. *Educational Researcher, 41*(26)*,* 26-28.

      doi:10:3102/0013189x11431010

Westhoff, L. M., & Polman, J. L. (2008) Developing preservice teachers' pedagogical content

      knowledge about historical thinking. *International Journal of Science Education, 22*(2),

      1-28. Retrieved from

      http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ818470

Wettersten, J. A. (1992, April). *High school department chairs as instructional leaders: Four*

      case studies. Paper presented at the Annual Meeting of the *American Educational*

      Research Association, San Francisco, CA.

Wilson, N. S., Grisham, D. L., & Smetana, L. (2009) Investigating content area teachers'

    understanding of a content literacy framework: A yearlong professional development

    initiative. *Journal of Adolescent & Adult Literacy, 52*(8), 708-718.

    doi:10.1598/JAAL.52.8.6

York-Barr, J., & Duke, K. (2004). What do we know about teacher leadership? Findings from

    two decades of scholarship. *Review of Educational Research, 74*(3), 255-316.

    doi:10.3102/00346543074003255

Zepeda, S. J., & Kruskamp, B. (2007). High school department chairs—Perspectives on

    instructional supervision. *The High School Journal, 90*(4), 44-54.

    doi:10.1353/hsj.2007.0018

Appendix A: INTERVIEW QUESTIONS

Background/Demographic Questions- (probes- Patton, 2002)

1. How long have you been a teacher?

2. What prompted you to become a teacher (How did you get into teaching)?

3. What prepared you for the teaching profession?

4. What content areas have you taught while you have been teaching?

5. How did you become a department chairperson?

6. How long have you been a department chairperson?

Central Questions

1. How do teachers grow in their teaching practice? (Opinion/Values)

2. At what point in your career did you feel confident in your teaching? What helps you feel confident about your ability to teach? (Feeling Questions)

3. What do you think makes a teacher successful to help students learn? What would be an example of helping students learn? (Opinion/Values)

4. What do you think makes a teacher successful to help students learning particular content? What would be an example of helping students learn particular content? (exact example)

5. How would you describe the importance of a teacher knowing the content he or she is teaching? (Feeling Question)

6. How would you describe the importance of a teacher knowing appropriate teaching methods? (Opinion/Values)

7. How do you see the content area of _____ intersecting with ways of teaching? (Opinion/Values)

8. How do you match particular teaching methods to a particular lesson or unit? How does your knowledge of particular content play a role in the type of teaching methods you use?

9. Can you give me an example of when your knowledge of teaching methods and knowledge of content came together while you were teaching?

10. How does your understanding of your own teaching help you help other colleagues? (Feeling Questions)

11. How do teachers in your department work together? (Exact Question)

12. How do you share ideas in your department? (Exact Question)

13. When people in your department get together, what do you talk about? Do you or the colleagues talk about content? What spurs your conversation with your colleagues? (Exact Question)

14. How does being a department chairperson help you help other colleagues? (Exact Question)

15. What role do you as the department chairperson play in helping them work together and share ideas? (Opinion/Value)

16. What else would you like to share that you have not had a chance to share?

Appendix B: LETTER of INVITATION

Dear _____ :

My name is Jonathan Greene and I am a student enrolled in the Educational Leadership doctoral program at UNF. I am conducting a research study on how secondary level department chairpersons understand their role in assisting their colleagues in understanding the blending of teaching methods and content. You are invited to participate in this research study. Data will be collected from approximately 15-20 people who are currently department chairpersons at a secondary school in Clay County.

The purposes of this study are: (1) to learn how department chairpersons understand the intersecting of teaching methods and content, and (2) to understand the role department chairpersons play in facilitating the growth of the blending of teaching methods and content among their colleagues. The benefit of participating in the study is to have your thoughts, knowledge, and understandings heard on a subject that receives little attention yet has the potential to enhance teachers' instruction and thus, student learning.

Thank you for your consideration. If you would like to participate, please call me ▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ stating your interest and I will email you further instructions regarding the completion of an informed consent form.

Sincerely,

Jonathan Greene

Appendix C: LETTER of INFORMED CONSENT

Dear Participant,

Hello, my name is Jonathan Greene, and I am a graduate student at the University of North Florida. As part of the requirements for the Doctoral program in Educational Leadership from the University of North Florida, I am conducting research into how department chairpersons understand their role in the blending of teaching methods and content for themselves and their colleagues' development.

You have been asked to participate in this study because you are currently a department chairperson at a secondary school. Participation is voluntary. If you agree to become a participant in this project, you will be interviewed. I expect that the interview in this study should take an hour to an hour and quarter of your time.

The responses to the interview questions will be confidential. To prevent identification of participants, pseudonyms will be used. There is no reason to conclude that injury will result from your participation in this study. Because participation in this study is voluntary, and you may refuse to answer any questions or withdraw yourself from participation at any time. Your name will not be disclosed or be given without your written permission unless in a court order of law.

You will be told of important new findings or any changes in the study or procedures that may affect you. You do not give any of your rights away by taking part in this research study. Data gathered from this study may be published or used in publications.

The interview will be audio recorded. Only the researcher and the transcriber will have access to the audio recorded interview, and, once transcribed, the data will be uploaded onto a secure server. You may request a transcription of your interview and a copy of the transcribed interview or participate in the analysis of the data collected to ensure that there is accurate and fair reporting of data. Data may be used for future research.

I will be pleased to answer any questions you may have concerning this study. You may talk with me ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ You may also contact my dissertation chairperson, Dr. Elinor A. Scheirer, ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ for further information. If you have any questions about your rights as a research participant, you may contact the chairperson of the Institutional Review Board at the University of North Florida, Dr. Jennifer Wesely, ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮

Though there is no compensation for taking part in this study, the benefit will be the information obtained from the results concerning department chairpersons' understandings into the blending of teaching methods and content.

Thank you for your consideration.

Sincerely,
Jonathan Greene

████████████████

██████████████████

Dr. Elinor Scheirer

████████████████

██████████████████

I _____ (print name) attest that I am at least 18 years of age and agree to take part in this study. A copy of this form was given to me to keep for myself.

VITA

JONATHAN K. GREENE

SUMMARY OF QUALIFICATIONS

- An articulate, well-educated, lifelong learner and a highly motivated professional exceptional

- Ability to lead with team building qualities; excellent interpersonal and verbal/written communication skills.

- An accomplished public speaker, presenter, and professionally-trained instructor.

- A dedicated believer in learning communities within an organization and able to work well with other professionals, a team player.

- A dedication to historical content and a commitment to professional development.

EDUCATION

UNIVERSITY OF NORTH FLORIDA, Jacksonville, Florida
Doctorate of Education
- Degree conferred December 2016
- Member of the Pi Lambda Theta National Honor Society
- Recipient of the Gladys Roddenberry Fellowship Award for 2011
- Dissertation Study titled "Secondary-School Department Chairpersons' Perceptions of Pedagogical Content Knowledge" advised by Dr. Elinor Scheirer
- Coursework in Human Resources, Group Design, Organizational Theory, Qualitative and Quantitative Research Methods, Professional Development, and Learning Theory

UNIVERSITY OF NORTH FLORIDA, Jacksonville, Florida
Master of Arts, History
- Degree conferred August 2007
- Primary Concentration in American History
- Secondary Concentration in European History

- Worked on the *Florida Secession Papers* Project with Dr. Aaron Sheehan-Dean

FLAGLER COLLEGE, St. Augustine, Florida
Bachelor of Arts, History   Minor: Religion
- Degree conferred May 2002
- *Dean's List*, Studied abroad in Rome and Florence, Italy with Dr. Timothy Johnson
- Worked with St. Augustine City Archeologist, Mr. Carl Halbirt
- Attended on Baseball Scholarship

TEACHING EXPERIENCE

2011-
Present

DUVAL COUNTY SCHOOL BOARD, Jacksonville, Florida
American History, Advanced Placement History and Student Learning Strategies (Dual Enrollment with FSCJ) Teacher- Atlantic Coast High School
- Engage in formal classroom instruction in American History to approximately 180 students, 11th grade; prepare wide variety of classroom instructional materials using Microsoft PowerPoint, Primary Sources, and other audio/visual aids; maintain strict classroom discipline and motivate students in their studies.
- Participate as a Mentor to a novice teacher
- Active member in the AP Professional Learning Community
- Serve as the Rho Kappa Social Studies Honor Society Sponsor
- Participate in the Teaching American History Grant
- Attended the Teaching American History Grant Summer Professional Development field trip to Gettysburg, PA, Philadelphia, and Washington D.C.
- Completed Summer Professional Development training at the *History Alive!* workshop
- Served on 11th grade U.S. History book adoption committee
- Completed Advanced Placement U.S. History Summer Institute

2008-
Present

FLORIDA STATE COLLEGE AT JACKSONVILLE at the North/Nassau Campus, Cecil Campus, and Kent Campus in Jacksonville, Florida
Adjunct History Professor
- Guide College Instruction in African American and American History from Prehistory to the Present
- Integrate technology during instruction
- Enhance student writing and study skills
- Instruct classes ranging from 6 to 36 students

2004 -
2011

DUVAL COUNTY SCHOOL BOARD, Jacksonville, Florida
History Teacher, 8th Grade - J.E.B. Stuart Middle School
- Engaged in formal classroom instruction in American History to approximately 125 students, aged 13-14; prepare wide variety of classroom instructional

materials using Microsoft PowerPoint and other audio/visual aids; maintain strict classroom discipline and motivate students in their studies
- Participated as the Social Studies *Department Chair*
- Participated as a Mentor to a Novice teacher
- Participated in the Teaching American History Grant
- Participated as the head scholar bowl coach and assistant baseball coach
- A faculty *Team Leader*, a *Leadership Team* Member, sponsored *Student Council*, member of the school's *Foundation Team* which is a school-wide disciplinary and discipline implementation effort
- Participated in the after-school *Team-Up* tutoring program and *Saturday School* for academic recovery assistance
- Served as a directing teacher for University of North Florida Intern Program

2003 -   ARLINGTON COUNTRY DAY SCHOOL, Jacksonville, Florida
2004   **Math & Science Teacher**
- Taught Algebra, Geometry and Earth Sciences to 4 daily classes of approximately 15 students per class
- Participated as an assistant coach on both Varsity and Junior Varsity Baseball

CURRICULUM WRITING EXPERIENCE

2012-   DUVAL COUNTY SCHOOL BOARD, Jacksonville, Florida
Lead writer of the 11th grade U.S. History Benchmark Test writing team
- Co-author of the 11th grade U.S. History Benchmark Test

2011-   DUVAL COUNTY SCHOOL BOARD, Jacksonville, Florida
2012   Writer for the 8th and 11th grade U.S. History Curriculum
- Co-author of the 8th grade U.S. History Curriculum
- Revised curriculum for 11th grade U.S. History

2010-   DUVAL COUNTY SCHOOL BOARD, Jacksonville, Florida
Lead writer for Middle School End of Course Exams writing team
- Co-author of the End of Course exams for Middle School social studies courses

2008-   UNIVERSITY OF NORTH FLORIDA, Jacksonville, Florida
2009   Writer for after school Middle School curriculum
- Co-author of the 7th grade curriculum for College Reach-Out Program under the coordination of Florida Institute of Education

CERTIFICATIONS/AWARDS

STATE OF FLORIDA

- Certified Clinical Educator Trainer (2010)
- Middle Grades Integrated Certification (2009)
- Teacher Professional Certificate in Social Science grades 6-12 (2007)

UNIVERSITY OF NORTH FLORIDA
- Gladys Roddenberry Fellowship Reward Recipient (2011)