THE ROLE OF PERSONALITY AND PROFESSIONAL LEARNING COMMUNITY QUALITY IN PREDICTING TEACHER EFFECTIVENESS

by

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A Dissertation
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of
Doctor of Philosophy
Education

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DEDICATION

This is dedicated to my family.
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This study's main purpose is to illuminate how teacher personality and Professional Learning Community (PLC) quality contribute to teacher effectiveness. Fifty-seven (N = 57) K-3 teachers in approximately 30 PLCs participated. The study used survey instruments, teacher observations and interviews. Study instruments included a demographic survey, the NEO Personality FFI-3 personality measure, a PLC quality survey, and the Classroom Assessment Scoring System. Interviews were also conducted with two highly effective teachers to explore teacher beliefs about factors that enhance their teaching effectiveness and what constitutes a high-quality PLC. Hierarchical linear modeling and hierarchical multiple regression were used to analyze connections among personality, PLC quality, and teacher effectiveness variables whereas etic coding was used to analyze the qualitative data. Key findings include the importance of PLC membership to teacher effectiveness in providing students with emotional support.
mean scores of Agreeableness and PLC collegiality predict teachers’ emotional support effectiveness. Individual teacher Agreeableness and Extraversion predict teacher effectiveness in providing instructional support. PLC mean scores of Openness to Experience and Agreeableness predict PLC cohesion. Interviews with teachers stressed the importance of PLC structure, autonomy, and collegiality to teacher effectiveness. The results of this study fill gaps in the literature about predictors of teacher effectiveness and PLC quality. Implications for administration are discussed, including suggestions for implementing enabling conditions and distributed leadership to facilitate PLC quality. Limitations include the newly developed PLC quality measure, sample size, and relatively infrequent PLC meetings.
1. INTRODUCTION

Attracting and retaining effective teachers has been called the most important education policy issue today (Hanushek & Rivkin, 2007). Quality teaching is critically important in determining student academic success (Alliance for Excellent Education, 2005; Bill and Melinda Gates Foundation, 2013; Darling-Hammond & Sykes, 2003; Hanushek & Rivkin, 2007; Hoerr, 1996). In fact, many researchers maintain that having a string of excellent teachers can even help offset a negative home environment (Hanushek & Rivkin, 2007). However, substantial variation in teacher effectiveness exists (Darling-Hammond, 2013; Darling-Hammond & Sykes, 2003; Hanushek & Rivkin, 2007; Hanushek & Rivkin, 2010). The No Child Left Behind Act (NCLB, also known as the Elementary and Secondary Education Act) of 2001 brought the state of American schooling to the public’s attention and placed American schools in the midst of a huge federal effort to improve and equalize public schooling. American schools are among the most unequal of industrialized countries in terms of the distribution of textbooks, technology, facilities, teachers, and most importantly, student outcomes (Darling-Hammond, 2006). This inequality necessitates a closer look at how to improve and equalize children's access to highly effective teachers. Better predictors of teacher effectiveness are needed to explain quality differences across the U.S. (Duckworth, Quinn, & Seligman, 2009). Teacher effectiveness can be increased by improved hiring
and professional development. Hiring people well-suited to the profession can improve retention and teacher effectiveness; supporting teacher collaboration has been shown to relate to teacher effectiveness if those interactions are collegial and focused on teaching and learning.

Improving teacher effectiveness, because it is perhaps the most important determinant of school quality and student achievement, is one way to address America’s educational inequities (Darling-Hammond, Holtzman, Gatlin & Helig, 2005; Hanushek & Rivkin, 2010). Hanushek (2009) showed that eliminating 6-10% of the worst teachers could have a dramatic impact on student achievement even when those ineffective teachers were replaced with only average ones. The NCLB Act calls for a “highly qualified teacher” in every classroom, but evidence shows that high qualifications alone – degrees, certain coursework and full certification—are inadequate predictors of highly effective teaching (Darling-Hammond, 2006; U.S. Department of Education, 2004). Therefore, the language used when discussing issues of school improvement and teaching quality needs to change, because a “highly qualified teacher” might not have the positive impact that a “highly effective teacher” does. The United States Department of Education (2013) defines behaviors of highly effective teachers and the resultant student outcomes: "highly effective teachers accelerate student learning, close achievement gaps that have persisted for decades, and build habits of mind that changed the trajectory of student lives, resulting in lower dropout rates, lower rates of teen pregnancy, and greater lifetime earnings and career satisfaction" (p.1). To address the nation’s achievement gap between low- and high-socioeconomic status (SES) students, a key component is increasing the
numbers of effective teachers nationwide, but particularly in high need areas (Darling-Hammond & Sykes, 2003).

Predicting whether a teacher will be highly effective is difficult and, as yet, imperfect. Traditional predictors of teacher effectiveness such as years teaching and education are not consistently linked to student achievement (Darling-Hammond, 1999; Hanushek & Rivkin, 2010). The current study explores the predictive value of two other factors—personality and professional learning community (PLC) quality—in relation to elementary school teachers’ effectiveness. Some other professions use personality measures as one criterion in determining a person’s likeliness to succeed at work, and this study will answer whether considering teachers’ personality might be a useful method to improve school hiring practices. Nevertheless, improved hiring practices alone are insufficient. Existing teachers need ongoing support and development to rise to the challenge of continuous school improvement. The prescribed school structure for teacher collaboration is the increasingly ubiquitous PLC, usually a grade-level or curriculum team. Teachers’ PLCs hold great promise as mechanisms for professional development and organizational learning, but more empirical evidence about PLCs’ relation to teacher effectiveness is needed. This study addresses the problem of predicting teacher effectiveness by examining personality and PLC quality as teacher effectiveness predictors.

**Statement of the Problem**

Inequities in America’s school system are striking. In contrast to high-poverty schools, schools in high-income suburban areas perform staggeringly well on
international academic comparisons (Shapiro, 2013). The Program for International Student Assessment (PISA), run by the Organization for Economic Cooperation and Development, is an international assessment that measures fifteen-year-olds’ reading, math, and science literacy (http://www.oecd.org/pisa/aboutpisa/). In 2012, 105 U.S. schools participated in the PISA (Shapiro, 2013). Students at Thomas Jefferson High School in northern Virginia scored highest on the assessment, far exceeding their U.S. peers and even those in Shanghai, China, previously ranked as among the best in the world on the PISA test (OECD, 2010). In contrast, other U.S. students performed 30% below the U.S. average, highlighting the glaring differences in U.S. public education’s student outcomes (Shapiro, 2013).

To help explain such unequal achievement among American public school students, many people look to school quality indicators—one indicator that continues to garner much attention is graduation rates. American high school graduation rates are some of the most unequal of industrialized countries. While graduation rates top 95% in most European and Asian countries, they hover around 75% in the U.S. and vary according to region and student socioeconomic status (SES) (Darling-Hammond, 2006). The U.S. Department of Education’s report, The Condition of Education 2013, details the indicators of educational success, including high school graduation rates (Aud et al., 2013). Graduation rates show disparities based on community type: a 68% high school graduation rate for urban children as opposed to an 81% rate for suburban children (Aud et al., 2013). Looking at the U.S. high school graduation rates by race/ethnicity paints an even starker image of educational inequity: for the school year 2009-10, the average
graduation rate ranged from 66% (Black students) to 93% (Asian/Pacific Islander students) (Aud et al., 2013). High school graduation rates matter more than ever because jobs requiring only a high school diploma are increasingly scarce and do not provide avenues into the middle class (U.S. Department of Education, 2013). Researchers try to explain these achievement disparities by looking at differences in teacher effectiveness according to the student populations they serve (Murnane & Steele, 2007).

School district disparities in teacher salary and working conditions have been examined as contributors to the education system’s unequal student achievement results (Murnane & Steele, 2007). Hanushek and Rivkin (2007) examined data from the 1999-2000 School and Staffing Survey (SASS) to identify patterns in teacher salaries and working condition by region (Northeast, Midwest, South, West) and community type (urban, suburban, rural). They found that urban and suburban teachers in the Northeast received the highest salaries. That said, a relatively small average salary difference existed between urban and suburban schools, not enough of a difference to explain the difficulty urban, low-SES districts have in recruiting and retaining teachers. The researchers therefore looked at working conditions by community type to help explain differences in staffing and found that regarding survey items on school working conditions, urban districts stood apart from all others in most respects. More urban teachers report job problems and have lower job satisfaction. Because urban districts have higher student need, worse working conditions, and only equivalent (not higher) salaries compared to suburban districts, high-quality teachers disproportionately choose to work in suburban districts (Hanushek & Rivkin).
An analysis of teacher salaries, working conditions, teacher turnover, and current educational policy suggests that schools serving poor, minority, and low-achieving students do indeed have a shortage of high-quality teachers (Hanushek & Rivkin, 2007; Murnane & Steele, 2007). Closing the achievement gap requires equalizing teacher quality in schools (Darling-Hammond & Sykes, 2003). The United States does not face an overall shortage of high-quality teachers—some schools have an abundance of qualified applicants whereas others—mostly those with poor and minority students—suffer from consistent shortages. Salary and working conditions are major contributing factors to teacher attraction and retention, particularly in these notoriously hard-to-staff schools (Darling Hammond & Sykes, 2003; Hanushek & Rivkin, 2007).

In addition to the stressful work environment teachers face, uncompetitive salaries and general lack of respect for the profession contribute to the lack of quality applicants (particularly in low-SES districts) and high teacher turnover (Hanushek & Rivkin, 2007; Ladd, 2007). As Hanushek and Rivkin (2007) write, “people will sort across occupations and industries according to their skills, the salaries being offered, and working conditions” (p. 72). Teacher salaries are notoriously uncompetitive. Not only are U.S. teacher salaries low relative to those in other industrialized countries (Ladd, 2007), U.S. teacher salaries have steadily declined relative to that of other professionals’ salaries (Darling-Hammond & Sykes, 2003; Hanushek & Rivkin, 2007). Teachers earn 15% to 30% less than college graduates who enter other fields (Darling-Hammond & Sykes, 2003; Hanushek & Rivkin, 2007). The U.S. Department of Education (2013) acknowledges that in America, teachers are not recognized as members of a highly
regarded profession as professionals in other fields are, for instance, accounting, medicine, law, and engineering. Teachers do not have similarly high standards for entry into the field, competitive compensation, or a reward system in place for particularly high performing professionals (U.S. Department of Education, 2013). Some researchers assert that the decline in teachers’ relative salaries has likely contributed to a decline in average teacher quality (Hanushek & Rivkin, 2007).

In response to research showing that poor and minority students are often taught by less qualified teachers, the U.S. government has made concerted efforts to address the problem, largely focused on attending to teacher effectiveness and accountability (Jacob, 2007). One such effort was the Bush administration’s NCLB Act that attempted to address America’s educational inequities. Starting in 2006, for the first time, each state was required to deliver, to the U.S. Secretary of Education, its plan for ensuring low income and minority students are not taught disproportionately by inexperienced or uncertified teachers (Peske & Haycock, 2006). The Obama administration maintained this emphasis on teacher effectiveness and accountability as a means to increase student achievement, especially among America's traditionally underserved populations.

Along with emphasizing teacher education and credentialing, high-stakes standardized testing has swept over current education reform efforts as a way to hold educators accountable for student achievement. The current school (and teacher) accountability movement made the teaching landscape a more demanding and less friendly place (Diamond, 2007). The 2011 Phi Delta Kappa/Gallup Poll showed almost 70% of Americans reported hearing more negative stories about schools. The negative
onslaught faced by public schools relates to the standards and accountability movements. Many policymakers would have the public believe that quality standards and accountability are intertwined, but these are separate strands of educational reform. Conflating the two disservices teachers and students, as one is a movement that teachers and their unions support (rigorous learning standards) and the other one (high-stakes testing) is controversial and unproven in its ability to improve school quality (Layton, 2013). Education reform—particularly the fervor with which it has swept across the U.S. since 2001—deeply influences the teaching profession, burdening many schools with unproductive requirements and deadlines.

An appreciation of the amount of learning and adapting necessary in teaching can be gained from clearer understanding of the current accountability movement and how it differs from the standards movement. Understanding of teaching’s increased complexity—new standards, education policies, and teacher evaluations—does indeed illuminate the need for improved hiring and retention practices. Ravitch (2009) provides historical context to help delineate the difference between the standards and accountability movements, clarifying the differences in the two movement’s goals. The modern standards movement started after A Nation at Risk was released in 1983 during the Reagan administration (Ravitch). That report recommended:

- Strengthening the curriculum for all students; setting clear and reasonable high school graduation requirements that demonstrate students’ readiness for postsecondary education or the modern workplace; establishing clear and appropriate college entrance requirements; improving the quality of textbooks and tests; expecting students to spend more time on schoolwork; establishing higher requirements for new recruits into the teaching profession; and increasing teacher compensation. (Ravitch, 2009, p. 30)
The report triggered efforts to strengthen the national curriculum. For instance, professors at UCLA helped supervise the writing of voluntary national history standards that sought to teach history “through the lens of race, class, and gender” (Ravitch, 2009, p.17). However, politics obstructed progress as some of these efforts were attacked as left-wing and overly liberal. The ensuing backlash, influenced heavily by the business community, instead emphasized student testing (Ravitch, 2009). The goals espoused by *A Nation at Risk* were replaced by the goals of the accountability movement, characterized by “high-stakes testing, data-driven decision making, choice, charter schools, privatization, deregulation, merit pay, and competition among schools” (Ravitch, 2009, p. 21). Many of these issues remain current, contentious issues over thirty years later.

The Common Core State Standards (CCSS) illustrates how the standards movement and accountability movements become entwined. Most teachers support the CCSS (Layton, 2013), which are national standards for what students should know and be able to do in grades kindergarten through twelve in mathematics and reading (Kincaid & Johnston, 2013). The standards were phased in during the 2013-2014 school year by 45 states and the District of Columbia (Kincaid & Johnston, 2013). While teachers tend to favor the standards, what many teachers and the public question is the accompanying emphasis on standardized high-stakes assessments tied to those standards (Kincaid & Johnston, 2013; Layton, 2013; Bloom, 2013). Basing school and teacher evaluations on how well students perform on new tests raises questions not only of test reliability and validity but also whether it is fair to base teacher evaluations on student test scores in the first place (Bloom, 2013; Layton, 2013).
Although testing and accountability are not new to education, the intensity that has been placed on both in the last decade is unique. Stringent, high-stakes accountability is a dominant feature of the current educational reform movement, and assigning punitive consequences for low student test performance is a fairly recent phenomenon (Knapp & Feldman, 2012). Certainly, student testing is not new, but the emphasis that the current accountability system places on using student test scores as a measure of the whole school's—and individual teacher’s—success is unprecedented (Knapp & Feldman, 2012). Another new feature is specific national learning standards instituted by states since 2013 with the advent of the CCSS. Educators are not the only stakeholders contesting aspects of the current accountability system: Debate continues in state legislatures, Congress, and the media. Despite such debate, the emphasis on producing results remains, with the resultant high pressure environment creating a major learning challenge for teachers (Knapp & Feldman, 2012).

Discourse between legislators, governors, and some school superintendents on the one hand, and teachers’ union representatives on the other, highlights the difficult situation public school teachers face. Although Randi Weingarten, president of the American Federation of Teachers, supports CCSS implementation, tying teacher accountability to the standards within a year of their introduction increases pressures on teachers. Teachers have to learn new CCSS under a stressful situation where their students will also be tested on those new standards. In a May 2013 letter to Chiefs for Change, a group of education officials organized by former governor Jeb Bush who
criticized AFT’s reticence to tie accountability to the new standardized tests, Weingarten wrote:

Can you imagine doctors being expected to perform a new medical procedure without being trained in it or provided the necessary instruments — simply being told that there may be some material on a website?...Can you imagine a successful business rolling out a new product without the proper research and development, and without testing it? Of course not, but that’s what’s happening right now with the Common Core. (Layton, 2013, para. 15)

This contentious reform situation where teachers’ voices are largely unheeded and schools are forced to implement and simultaneously assess large-scale standard changes creates a challenging teaching environment. Teachers must learn quickly and develop new abilities and skills to thrive.

The CCSS are related in some ways to another national movement: the push to improve children's attainment of 21st-century skills (CA Department of Education, 2012; Trilling & Fadel, 2009). To gain 21st-century skills, students are to participate in engaging, personalized, and collaborative learning within a culture of respect and cooperation (Trilling & Fadel, 2009). The movement is spurred by the Partnership for 21st Century Skills, which has outlined a Framework for 21st Century Learning that it would like all states to adopt as the premier agenda for improving teaching and learning (Bellanca & Brandt, 2010). The Partnership would like states’ learning standards more closely aligned with their framework (Bellanca & Brandt, 2010). Indeed, the website for America’s largest teachers’ union, The National Education Association, features a link to the P21 Common Core Toolkit, a guide for aligning the CCSS with the Framework for 21st Century Skills (http://www.nea.org/home/ccss-toolkit.htm). Although the movement was not started by educators, some education organizations promote the importance of
21st century skills. The National Council of Teachers of English, National Science Teachers Association, the National Council for Social Studies, and the American Library Association are examples of professional education associations that have collaborated with the Partnership to develop online resource guides for integrating 21st century skills and content areas (Bellanca & Brandt, 2010).

In the last few years, as the teaching environment has become more stressful and negative in response to intense federal and state educational reforms, public opinion has shifted sharply in favor of teachers. The 2013 PDK/Gallup poll, updated every year since 1969, showed, surprisingly, that most Americans now distrust standardized tests. Public disapproval has grown, with most people now saying that increased standardized testing is hurting American education more than helping, with only 22% saying increased testing had improved their local schools, compared to 28% saying that in 2007 (Kincaid & Johnston, 2013). In 2012, 47% of respondents said they opposed using standardized test results for teacher evaluations. A year later, that percentage rose to 58%. The PDK/Gallup poll also showed that sentiment about testing was not the only change in public opinion of our education system. Perhaps in recognition of the many demands placed on teachers, 52% of Americans now assert teachers should have the right to strike, up from 40% in 1980 (Kincaid & Johnston, 2013). It seems the public is increasingly sympathetic to teachers under the increased state and federal pressures they face.

Recently, high teacher attrition has made national news headlines (Kain, 2011). The National Commission on Teaching and America's Future reported in 2003 that almost one third of America's new teachers leave within the first three years of
teaching—and nearly one half leave during the first five years (Barnes, Crowe, & Schaefer, 2007; Watts, Cage, Batley, & Davis, 2011). Interestingly, some research shows that teachers who leave the profession tend to be less effective teachers. Although turnover of less effective teachers may help schools achieve goals, high turnover in general does not, especially because there is no guarantee that the new teachers are any better than the ones who just fled. Schools need a committed group of quality teachers to create high student achievement. High turnover impedes school improvement efforts. Ways to alleviate it must be found.

Teacher retention and school quality should be increased by hiring people well-suited to teaching—people who will succeed and be satisfied with teaching. This study will extend literature on teacher effectiveness and contribute to enlarging the currently sparse research on teacher personality and job performance. Clarifying which teacher traits are most likely to predict quality teaching will help school leaders in their initial hiring decisions and could have the trickle-down effect of increasing teacher retention and school effectiveness.

Policy makers, researchers, and the public often assume that teacher turnover harms student achievement, but this is not unequivocally the case (Ronfeldt, Loeb, & Wyckoff, 2013). Undoubtedly, teacher turnover harms school improvement efforts because of a loss of institutional memory. School-level initiatives lose momentum when many teachers leave. Additionally, getting new hires up to speed on school improvement initiatives takes time and must be just one of many priorities in new teacher induction. Research shows that the teachers who leave the profession are the least effective teachers,
suggesting that some teachers lack a good fit with the profession. For others, particularly those who stay in the profession but move to other schools or districts, difficult working conditions drive much of the difference in teacher turnover rates between schools (Hanushek & Rivkin, 2007).

Although many researchers focus on the negative impact of teacher turnover on low income and low performing schools, research suggests that especially in these difficult teaching environments, the teachers who stay are the most effective ones. The fact that ineffective teachers leave urban, low-performing schools does not mean that their departure will necessarily increase those schools’ effectiveness because the schools have a particularly difficult time recruiting highly effective teachers. This creates a situation where there might be a cohort of effective, committed teachers in low-performing schools supplemented by an ever-revolving cast of inexperienced, unprepared teachers, making sustained school improvement difficult (Darling Hamming & Sykes, 2003).

Research findings suggest that teacher attrition can be addressed in two ways. First, hire candidates better suited to the profession. This can be conceptualized by two forms of fit: 1) person-job (PJ) fit—the alignment between a person’s characteristics and tasks required by a certain job—and person-group (PG) fit (an aspect of person-organization (PO) fit)—the compatibility between a person and their work group (Kristof-Brown, Zimmerman, & Johnson, 2005; Harris & Rutledge, 2010). Second, support and develop existing teachers who have the right characteristics but simply need to enhance their skills.
The demand for highly effective teachers is huge. Many teachers of the baby boom generation are retiring and there are high turnover rates among remaining faculty. Therefore, school leaders are expected to hire over 1 million teachers in the next decade (U.S. Department of Education, 2013). To address this demand, the U.S. Department of Education partnered with Microsoft's “Partners in Learning Network” to launch the TEACH campaign in 2009, which focuses on attracting high-achieving recent college graduates to a teaching career. The U.S. Department of Education (2013) states that, "we cannot expect to attract the most talented and promising individuals into the field and retain the most effective ones until compensation is commensurate with the expertise required and the difficulty of the work" (p. 10). The department states that increasing compensation and responsibility must be coupled with a meaningful system of evaluation and accountability. However, the current state of education is one where evaluation and accountability has been enacted without the accompanying increase in compensation.

School districts’ less-than-optimal hiring practices do not ensure high quality teacher candidates are selected (Boyd, Goldhaber, Lankford, & Wyckoff, 2007; Hanushek & Rivkin, 2007). Yet good hiring practices are an important way organizations improve (Bolander & Sandberg, 2013). When salaries and working conditions cannot entice candidates, selection practices need to assure that only the best candidates are selected. Some people are more likely to be effective teachers than others. School hiring practices should be examined to increase the chance that people hired to teach are well-suited to the profession.
Personality attributes necessary for effective teaching might not necessarily be the same as those critical to group productivity (Morgeson, Reider, & Campion, 2005). This is the difference between PJ fit and PG fit. The current study adds to the PG fit literature, still in its nascent stage (Kristof-Brown et al., 2005; Roberts, 2006). Researchers are just beginning to focus on the potential benefits of selecting employees based on how well they will fit with an organization’s culture (Sekiguchi & Huber, 2011). Although principals in schools with PLCs certainly try to consider how a teacher candidate will fit with existing PLC members, with no accurate personality testing, the quality of these organizational fit judgments is suspect. The current study will help inform school hiring practices in providing information about how personality affects teaching performance as well as PLC quality.

To ensure schools have highly effective teachers, current school hiring practices need reconsideration. Of the three most common personnel selection strategies—(1) the structured interview, (2) a personality test, and (3) a situational judgment test (Morgeson et al., 2005)—usually only the structured interview is used for teacher hiring. Some schools ask teacher candidates to complete assessments that cover teacher reactions to classroom situations or to teach mock lessons where students exhibit different behaviors. Personality tests are typically not used. The current study will examine whether a highly-regarded personality test provides predictive value about teacher effectiveness.

Much organizational research supports the importance of PJ fit, linking these attributes to employee satisfaction, commitment, retention, and performance (Sekiguchi
The high teacher attrition rate supports the argument that schools are not using effective hiring practices. Policymakers are increasingly looking to identify traits essential to excellent teaching. The U.S. Department of Education (2013) envisions America setting a higher bar for entrance into the teaching profession, with applicants displaying: strong content knowledge, instructional strategy mastery with knowledge of how and when to use such strategies, and dispositions and aptitudes to work effectively with students and colleagues. What exactly the department means by dispositions is not clarified, but Finland's teacher recruitment is cited as an exemplar. There, prospective teachers must demonstrate not only high achievement but also traits such as social and communication skills (U.S. Department of Education, 2013). Undoubtedly, one way to make hiring more valid, reliable, and effective would be to use valid, reliable assessment tools as part of selection criteria. Schools too often fall victim to overgeneralization of conclusions from the business world, so research is needed to inform whether personality measures, often used in business and other sectors as an integral part of the selection criteria, would be useful in the education setting.

Teaching is undoubtedly strongly influenced by educational reform efforts as new requirements are often pressed down upon teachers; some of these reforms are beneficial to teaching and are retained while most fade away as educational fads (Ravitch, 2009; Cuban, 1984). One of the demands being placed on increasing numbers of teachers around the country is for them to meet in PLCs to collaborate on instructional improvement. This requirement could work for or against quality teaching, depending on how PLCs are enacted in schools. If teachers are not supported and receive no guidance
about how PLCs should work, PLCs can become another time and energy drain in an already overscheduled teacher day. However, if PLCs are cohesive, collegial, supported, and focus on ongoing instructional improvement, they hold great potential as a school improvement mechanism. The current study addresses the need for predicting quality teaching by examining traditionally studied variables like teacher education and experience but also the less well-understood teaching quality predictors of personality and PLC quality.

With increased accountability demands, teachers turn to each other for support (Hargreaves, 2004; Diamond, 2007). Peer collegiality and collaboration are crucial to helping teachers respond to new external curriculum and assessment demands. With the widespread adoption of the CCSS and new state standards assessments constantly being rolled out, keeping up with the ever-changing demands is extremely challenging. Teamwork and coordination are essential to teacher adaptation and effectiveness in this highly dynamic educational environment. The education community increasingly recognizes that excellent teaching is almost impossible to master in isolation and that teachers should work together to improve their craft (Cuban, 1984; Shulman, 2004). Recently, teacher traditions of isolation and norms of privacy have given way to new norms of teacher instructional leadership and collaboration (Hargreaves, 2004). When teachers collaborate in PLCs, they may have increased feelings of collegiality and support. Through interactions with other teachers, teacher isolation is broken down and a more professional work environment is created (York-Barr & Duke, 2004).
The assumption that teacher collaboration improves teaching underlies school requirements for teachers to meet in PLCs, but little empirical evidence exists to prove the teacher collaboration-teacher effectiveness link (Lavie, 2006; Nadelson, Croft, Ennis, Harm, McClay, & Winslow, 2012). Because these new collaboration expectations arose rapidly, schools need information about how to support teachers in establishing and maintaining effective PLCs. What teachers used to grapple with individually—raising student achievement, managing discipline issues, analyzing test scores—has become a group endeavor. Successful group work requires individuals to work effectively with others (Morgeson et al., 2005). PLC quality likely affects PLC utility. If PLC members trust and respect each other and their collective work, PLCs should have a positive influence on teacher effectiveness. Conversely, if PLC meetings are contentious and members are discontented, PLCs could very well have a negative impact on teacher effectiveness.

Teacher collaboration holds great promise as a teacher retention tool because it may produce teacher collegiality and professional learning, leading to greater teacher efficacy and job satisfaction. However, when teachers are required to meet in PLCs whose members do not get along, the potential for instructional improvement is lost. When people must work together on a task, group member personality compatibility should be considered. Designing work around groups has recently become popular in organizations though little empirical research illuminates how individuals’ personality affects group dynamics and performance (Morgeson et al., 2005). More information
about what makes PLCs effective is necessary in supporting school improvement and
teacher effectiveness.

We need a multi-pronged approach to comprehensively examine factors
influencing teacher effectiveness. To measure impacts on teaching effectiveness, I
combine interviews and classroom observations with surveys of: (1) teacher’s
intrapersonal traits—education, experience, and personality, and (2) interpersonal
environmental characteristics, or PLC quality. This study’s model of PLC quality is
multifaceted and includes not only a measure of teacher collegiality but other dimensions
like group cohesion, learning orientation, and principal support. This dissertation
proposal will establish the study’s purpose of illuminating contributing factors to teacher
effectiveness, establish the study’s significance, and present a literature review that
guides the methodological design.

**Significance**

Ideally, when one considers which job field to enter, one’s personal attributes are
weighed against what is required to succeed in that field. A person selects a career whose
demands fit with the individual’s traits. If a good fit is not chosen, the person risks being
unsuccessful and dissatisfied. This study will help identify potential personality traits that
school leaders can look for when hiring teachers while recognizing that schools are social
systems where teachers are expected to work together. Previous studies have found that
“strong personalities and beliefs can also either hamper or facilitate” collaboration
(Brownell et al., 1997). This study will extend that literature by identifying teacher
personality traits that correlate with PLC quality and teacher effectiveness.
In addition to focusing on hiring ideal teacher candidates, attention to the school environment is critical. Schools must have cultures, scheduling, and staffing approaches that maximize student outcomes. Schools must include structured time for collaborative work and allow teachers access to internal school expertise (e.g., other school faculty members) as well as external expertise (e.g., school-university partnerships) (U.S. Department of Education, 2013). Collaboration encourages teacher adaptation and excellence in the turbulence of current educational reform. Fullan and Hargreaves (1996) describe this era as one in which the learning of teachers is inextricably bound to the learning of students. Teacher collaboration is a main conduit for teacher learning and development (Cochran-Smith & Lytle, 1999). Many positive outcomes are possible when teachers work together more effectively, but not all teacher groups are productive; instead, many are cynical and unproductive (Fullan & Hargreaves, 1996). Educators need clear understanding of what makes PLCs productive structures that have moral purpose, emotional engagement, and productive capacity (Fullan & Hargreaves, 1996).

Many impediments to functional, productive teacher collaboration exist. Teaching has long been referred to as “a lonely profession,” and this tradition can be difficult to overcome (Fullan & Hargreaves, 1996). Grappling privately, in isolation, with teaching’s challenges becomes a matter of habit and is taken for granted (Fullan & Hargreaves, 1996). However, teacher isolation poses many problems such as a limitation on new ideas and solutions and job stress (Fullan & Hargreaves, 1996). There is no doubt that teacher isolation is no longer viable and teacher collaboration is the new norm. To make the transition easier, we must understand group-level attributes that help teachers be more
effective. The mere act of teachers meeting together will not solve our current educational problems—only productive teacher groups capable of learning and developing will foster the teaching necessary for school improvement.

To address conflicting research findings about PLCs’ influence on teacher effectiveness, this study will focus on the quality of teacher interaction within PLCs to flesh out empirical evidence on faculty interactions. As Supovitz, Sirinides, and May (2010) write, “literature on how peers influence each other in schools is in a more nascent stage” (p. 37) than the more developed literature describing principals’ impact on instruction. Educators need better understanding about whether meeting in PLCs by itself improves teaching or whether PLC quality matters more than just making time to meet. Most likely, a grade-level or curriculum meeting’s interaction quality influences teachers’ effectiveness. Too often, however, administrators place PLC meeting requirements on teachers with little follow-through in supporting the quality of the meetings. Such oversights lead to precious teacher time being lost.

This study has important practical significance in its potential not only to influence teacher training and hiring but to inform school leaders about important school characteristics that foster quality teaching. Clarifying what factors shape teacher effectiveness has practical significance in that it helps school leaders respond to fervent calls for school improvement. In the current high-stakes educational environment where schools are under increased pressure to continuously improve; identifying teacher traits and school factors that influence teacher effectiveness is critical.
Purpose

This study's purpose is to identify teacher effectiveness predictors. More specifically, this study examines the impact of personality and PLC quality on teacher effectiveness (please see Appendix B for study concept map). These constructs cover potentially important contributing factors to teacher effectiveness. Although one can speculate that certain personality traits like Conscientiousness or Extraversion might contribute to someone being a highly effective teacher, methodologically sound empirical research on personality and teacher job performance is surprisingly scarce. Research in various occupational fields shows that personality measures play an important role in understanding people's behavior at work (Mount & Barrick, 1995). However, no study of which I am aware examines the variables involved in this study: personality, PLC quality, and teacher effectiveness. The current research will contribute to understanding predictors of teacher effectiveness by examining personality as a possible predictor.

A less understood but potentially powerful factor influencing teachers’ classroom performance is the school environment, particularly other faculty. Teachers interact with each other now more than ever. Educators are increasingly identifying teacher collaboration as one of the most important conditions for promoting instructional learning and change, but this assertion needs stronger empirical support (Collinson & Cook, 2007).

Many educators promote PLCs’ potential in raising student achievement. As DuFour and Eaker (1998) write, “the most promising strategy for sustained, substantive school improvement is developing the ability of school personnel to function as
professional learning communities” (p. xi). Assumptions that teacher collaboration improves teaching drive PLC requirements, but little empirical evidence exists to undergird the teacher collaboration-student learning connection. The highly social nature of teaching necessitates taking teacher collaboration into account when considering influences upon teacher effectiveness. This study addresses this question of how to marry what individual teachers bring to the profession with what they gain from interacting with others to increase teacher effectiveness.

This study’s practical purpose is to aid school improvement efforts by illuminating teacher and school factors that influence teacher effectiveness. Understanding how personality contributes to teachers’ effectiveness (PJ fit) will add to whether, like other professions, teaching might benefit from including personality measures as part of selection criteria. Understanding how group personality composition relates to group function (PG fit) will aid not only in initial hiring but in school faculty allocation practices as well. In elementary schools, where teachers are certified in multiple grade-levels, part of a principal’s decision for which teacher would be most effective where should probably include consideration of each grade-level’s PLC personality composition. Maximizing school improvement will require attending to each grade-level’s PLC quality and individual teacher effectiveness. In sum, the main purpose of this study is to illuminate how personality and PLC quality contribute to teacher effectiveness. Not only will this knowledge add to gaps in the literature on teaching practice, its practical significance is in its potential impact on teacher hiring and development.
Theoretical Framework

This study is based on the concept that teachers’ social system matters, making social systems theory a useful theoretical framework with which to examine teachers’ work. Viewing teaching as individualistic work unaffected by colleagues is no longer viable in most of the U.S. Particularly in many suburban and urban settings racked by wave after wave of educational reform, including the PLC movement, teachers have become interdependent. To survive and thrive in the changing educational landscape, teachers must reach out to peers for instructional and morale support. Identifying pertinent research at the nexus of personality psychology and organizational behavior is crucial for providing a theoretical framework to guide understanding of how individuals adapt to their work setting, particularly to other group members with whom they work closely, to increase individual and institutional effectiveness.

For centuries, humans have been considering how others influence human thought, emotions, and behavior. Schools too must consider group effects on individual performance. Teachers' group work affects teachers’ cognition and behavior. To fully understand teachers’ classroom performance, the school's social characteristics must be taken into account. It has been argued for over a century that an individual alone and that same individual in a group are two different psychological beings (Burnham, 1910). That is, a person left to their own volition often functions differently than that individual performing the same task among others (Burnham, 1910).

The current study uses social systems theory as the unifying theoretical framework for studying teachers’ work. Doing so requires merging research at the
intersection of social psychology, personality psychology, organizational psychology and education research. Senge (2012) identifies systems thinking as one of the five disciplines of learning organizations—schools that are “dedicated to the idea that all those involved with it, individually and together, will be continually enhancing and expanding their awareness and capabilities” (p. 7). Teachers’ work is now nested in group work, making their social system an important entity framing their instruction. Examining teachers working in groups requires using an interdisciplinary lens. Social psychology’s focus on bidirectional influences between individuals and groups (Zajonc, 1965), and Industrial/Organizational Psychology’s focus on group work performance make these two disciplines particularly useful when studying teacher groups’ influence upon teacher effectiveness.

PLCs are undoubtedly teacher groups, which are in turn social systems. Hackman (2012) provides clarification for why social systems theory is such a fitting theoretical framework for the current study. Hackman defines a group as “an intact social system, complete with boundaries, interdependence for some shared purpose, and differentiated member roles” (p. 429). A social system is comprised of individuals with functionally interdependent relationships (Dale, Smith, Norlin, & Chess, 2006). Examples of social systems range from small to large and include families, social groups, and larger organizations such as communities and societies. Dale and colleagues (2006) outline assumptions that comprise the social systems perspective. These social systems assumption pertinent to the current study are:
The world has an underlying general order and the social order is a subset of this general order. As Dale and colleagues (2006) specify, two further scientific suppositions underlie this first assumption. First, a universal general order exists. Second, humans can understand this order. PLCs are an educational reform mechanism schools use to respond to the outside order. For teachers, being part of an effective PLC can help them respond to new accountability requirements by adapting to newly imposed standards. Schools are open systems, particularly in the last few decades, and must respond to public pressure as quickly as possible.

Social ordering is the dynamic process that responds to: conditions in the general order, humans’ needs, and the social institution's needs. The social order's dynamic quality can partly be understood in reference to the changing general order (Dale et al., 2006). Teacher participation in PLCs helps meet three human needs: the need for structure (Dale et al., 2006), status, and belonging (Roberts, 2006). The need for social regard, a type of status most likely achieved in the school setting by teaching and collaborating well, and belonging and identifying with a social group, can be satisfied by participation in a well-functioning PLC. If a person feels a strong sense of belonging to a group and has a position of importance in the group, many of their important needs are met. This aspect of the social system that describes humans’ need for belonging is measured in the current study by the PLC Quality survey’s cohesion subscale. The importance of cooperation with group members for overall group function is measured by the collegiality subscale of the PLC quality survey.
All human social behavior is purposive. Dale and colleagues (2006) assert that all social behavior is purposive and conducted through social relationships. The general purpose of PLCs is to increase student achievement by improving teacher effectiveness. DuFour (2004) maintains that as schools move towards ensuring that all students learn, PLCs help teachers engage in ongoing discussion to drive student learning. The purposive behavior teachers engage in is producing student learning. In this study, the PLC quality survey’s learning orientation subscale reflects social system theory’s assumption that human behavior is purposive. A group’s success likely rests on its ability to maintain its focus.

When social organizations are fully developed, they display self-maintaining and development characteristics. Until reaching the self-maintaining stage, social organizations change to eventually reach the stage where members’ behavioral patterns are normed and regulated, allowing achievement of the organization’s purpose (Dale et al., 2006). This fourth assumption of social systems theory points to one way to increase teacher retention through attention to PLC quality. When a grade-level is composed of teachers who collaborate well, interacting collegially to increase their instructional abilities, the group is more likely to self-maintain.

Schneider’s attraction selection attrition (ASA) model helps to explain how social organizations have a tendency to become self-maintaining over time by becoming increasingly homogenous (Roberts, 2006). This occurs primarily through two mechanisms: 1) people who have common characteristics to the
organization seek it out because it better fits their own traits—a version of both PJ fit and PG fit, and 2) organizations seek out individuals who match the organization's culture (PG fit) (Roberts, 2006). Of course, the ASA model is only one way organizations maintain their culture--shared organizational learning is another way an organization develops. The current study examines PLCs’ personality compatibility as well as the PLCs’ group learning behaviors to help explain overall PLC quality.

- A social organization is greater than the sum of its parts. A social system’s output cannot be understood by reducing it to its individual components (Dale et al., 2006; Hackman, 2012). The group is comprised of certain qualities together that would be difficult or impossible to access from the group’s individuals. DuFour (2004) makes the crucial point that in PLCs, “each teacher has access to the ideas, materials, strategies and talents of the entire team” (p. 10). PLC discussions are a main professional development mechanism that can help all teachers reflect upon and adjust their practice. Because of this unique group-level attribute, studying teacher PLCs will help shed light upon an important aspect of teachers’ school environment. This perspective focuses on the relationship among individuals rather than the individuals themselves (Brass, 1995). Studying the system is important because individuals are embedded within a system of interrelationships with other individuals.

- All human beings and their social organizations have the capacity to achieve well-being. This assumption is guided by humanistic theory and holds that well-being
is characterized by a healthy or harmonious state between the individual and the social environment (Dale et al., 2006). Ideally, PLCs are functional, productive, and capable of adapting to their local systems (the school, district, state, etc.). A PLC that has achieved well-being in that it helps teachers improve practice while responding to outside pressures is more likely to foster effective teaching practices than a PLC that is dysfunctional and unproductive.

- All forms of fully developed social organization can be characterized and studied as social systems. Fully developed social systems have organizational parts that are functionally connected and interdependent (Dale et al., 2006). In the current study, teachers will be studied individually while also taking into account their PLC quality.

- The social relationship is the fundamental structural unit of all social systems. Improved social functioning enhances individual's well-being (Dale et al., 2006), in turn influencing the social system’s health. Measuring the quality of PLCs’ social relationships, via collegiality and cohesion, will help clarify the connection between PLC social health and teacher effectiveness.

Systems thinking is an important aspect of school improvement because it acknowledges the interdependency inherent in schools and helps explain how schools and teachers can adapt to external changes and forces (Senge, 2012). A healthy social system functions efficiently, adapts to the environment, and achieves its goals (Dale et al., 2006). Identifying what enables a social system’s health is crucial. When studying social systems, identifying the system boundary is necessary (Dale et al., 2006; Hackman,
Boundaries determine outsiders from insiders and contribute to group cohesion and productivity.

The current study draws the social system boundary at the teacher grade-level team, making this the focal system. Using social systems theory to view schools’ faculty interactions helps highlight interaction characteristics that might foster or hinder healthy, productive team interactions. The current study posits that a social group’s cohesion, collegiality, leader boundary maintenance, and learning orientation are all important mechanisms that enhance organizational outcomes, in this case, quality teaching. When teachers are called to work in groups as a means toward school improvement, complete understanding of group dynamics’ effects on members’ behaviors is paramount. Therefore, the following research questions are addressed in the current study:

1. How much variance in teacher effectiveness is accounted for by the PLCs the teachers are in?

2. Do teacher background characteristics (education and experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and/or PLC quality (cohesion, collegiality, learning orientation) predict teacher effectiveness (Classroom Assessment Scoring System--CLASS’s--emotional support (ES), classroom organization (CO), instructional support (IS) domains)?

3. Does PLC personality composition (both individually and as a group) predict PLC quality and teacher effectiveness (CLASS domains)?
4. What do highly effective teachers believe constitutes: 1) effective teaching (particularly emotionally supportive teaching) and 2) high-quality PLCs?

Summary

Teacher effectiveness is the most important component of school quality. Attracting and retaining effective teachers is critical to improving America's education system. Teachers currently face a stressful work environment caused by a number of educational reform movements including NCLB, CCSS, and 21st-century learning skills. Teachers must quickly adapt to new requirements. Another demand that is placed on teachers is the requirement to collaborate in PLCs. Undoubtedly, some teachers are better suited to the profession than others. This point is conceptualized by person-job fit. In many American schools where teachers work in PLC, the concept of person-group fit is arguably just as important. Although PLCs might certainly help teachers develop, the assumption that teacher collaboration improves teaching is not yet fully supported by a preponderance of research evidence. Social systems theory holds that a person functioning within that group performs the tasks differently than that same person functioning alone. It is therefore an appropriate theoretical framework for the current study. The teaching profession should no longer be studied as if teachers work in isolation. The current study aims to address current school improvement efforts by illuminating the value of teacher personality and PLC quality in predicting teacher effectiveness.
Definition of Terms

**Teacher effectiveness.** The degree to which a teacher exhibits strong instruction, enabling a wide range of students to learn (Darling-Hammond, 2013) by providing an emotionally and instructionally supportive, organized learning experience.

**Highly qualified teacher.** Teachers who: (1) possess a bachelor’s degree, (2) hold full state certification, and (3) prove that they know each subject they teach (through majoring in the subject they teach, through coursework equivalent to a major, passage of the state developed test, or a graduate degree (U.S. Department of education, 2004).

**FFM.** The five factor model identifies five factors as encompassing important personality traits: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

**Openness to Experience.** This factor represents a person’s propensity for seeking out new experiences and includes a person’s appreciation for feelings, aesthetics, and intellectual curiosity (McCrae & Sutin, 2007).

**Conscientiousness.** This factor is also referred to as “will to achieve” and represents a person’s tendency to control behavior in achievement of goals. Someone high in this factor would be competent, orderly, dutiful, and deliberate (McCrae & Sutin, 2007).

**Extraversion.** This factor represents a person’s inclination towards positive emotions, excitement-seeking and interpersonal interaction. A person high in this factor is warm, active, and assertive (McCrae & Sutin, 2007).
**Agreeableness.** This factor represents a person’s tendency towards compassion and compliance with others. Someone high in Agreeableness would be trusting, altruistic, tender-minded, and avoid conflict (McCrae & Sutin, 2007).

**Neuroticism.** This factor represents a person’s tendency to experience negative affect and emotional distress, including anxiety, anger, depression, self-consciousness, stress, and impulsiveness (McCrae & Sutin, 2007).

**PLC.** A professional learning community that promotes and sustains the professional learning of its members with the collective purpose of enhancing student learning (Vescio, Ross, & Adams, 2008).

**Cohesion.** The degree to which PLC members feel united including how much they enjoy their time together and feel like included members of the PLC.

**Collegiality.** The degree to which the PLC exhibits functional interpersonal behaviors including cooperation, collaboration and open dialogue.

**Learning orientation.** The degree to which PLC meetings serve as learning mechanisms--focusing on curriculum and instruction rather than just managerial issues (field trips, meeting deadlines, dealing with parent issues, etc.).
2. LITERATURE REVIEW

Teacher effectiveness is a critical aspect of school quality and student achievement. With teacher turnover notoriously high and baby boomers retiring, the need for highly effective teachers is great, yet attracting and retaining effective teachers in the U.S. leaves much to be desired. Better predictors of individuals likely to be collegial, effective teachers are still needed. Relatively low salaries and stressful working conditions also need to be addressed.

Of the numerous educational reform movements that have recently swept the country, including the CCSS, the emphasis for teachers to work with colleagues in PLCs to improve teaching and learning is an added demand but one that could actually alleviate stress and improve effectiveness. The current study explores the value of using teacher personality and a new measure of PLC quality in predicting early childhood educators’ effectiveness. The current chapter will examine literature on traditional and potential predictors of teacher effectiveness and important aspects of group dynamics that should be considered because of new requirements for teachers to collaborate in PLCs.

Predicting and Measuring Teacher Effectiveness

Predicting teacher effectiveness has confounded researchers and educators for decades. Although an ideal measure of teacher effectiveness is directly measuring what
teachers contribute to student learning, this has so far been infeasible as no achievement test completely and accurately measures student knowledge (Ferguson & Brown, 2000; Popham, 2010). An example using SES illustrates why. One child living in a high-poverty area, with few books, no computers in the home and low supervision in the home acquires most of her academic knowledge (i.e., the kind of learning standardized tests measure) at school. But another child, living in a highly affluent area whose home is full of books and computers and who participates in enrichment programs organized by his parents might learn much academic knowledge by virtue of this enriched environment. Attributing that learning to his teacher would be inaccurate. Because so much of what the second student learns is a result of his circumstances, the two children might actually learn identical amounts at school, but the second child’s teacher would appear more effective than the first child’s teacher. Even if gain scores were used, this SES impact is not overcome because the two children’s rate of learning is still different because of all of the out-of-school academic learning the child in the second example receives. This example illustrates the dilemma of using standardized testing to measure teacher effectiveness. Although some advanced value-added measures of testing attempt to control for SES, this does not completely solve the problem because of lack of random assignment of teachers to classrooms and validity threats associated with current standardized tests (Harris, 2011; Popham, 2010). School tracking procedures and a general lack of standardized test instructional sensitivity makes using student test scores questionable (Harris, 2011). Therefore, it remains very difficult to accurately measure the learning teachers impart to their students within a given year.
Factors used as predictors of teacher effectiveness include attributes of teachers such as academic or intellectual ability, education (including certification, degree attainment and/or specific coursework), teaching experience, student test scores, and classroom behaviors (Darling-Hammond, 1999; Ferguson & Brown, 2000). Traditional measures of teacher effectiveness are teacher education and experience. In the current accountability climate, teacher evaluations are moving away from measuring whether teachers are highly qualified (hold certain degrees, have passed certain examinations, etc.) to whether they are highly effective (exhibit best practices, increase student achievement scores, etc.).

Whether the traditional predictors of teacher quality—degrees and years teaching—are actually reliable, valid predictors is a matter of some debate. Experience and teacher education are the primary determinants of teachers’ positions on district salary scales (Ballou & Podgursky, 2002). Because of this, it is often assumed that more experienced and highly educated teachers are earning more because they are more effective (Hanushek & Rivkin, 2007). However, research has been accumulating over the previous decades that these two variables might not strongly relate to teacher effectiveness.

Publication of the Coleman Report in 1966 ignited skepticism about the relation between teacher qualifications and teacher quality (Darling-Hammond, 1999; Hanushek & Rivkin, 2007). The report suggested that the commonly used teacher effectiveness measures of education and experience had little relation to actual student achievement. Instead, teachers’ verbal skills and educational history related more to quality (Coleman,
Campbell, Hobson, McPartland, Mood, & Weinfeld, 1966). The authors concluded that student background had an extremely large effect on student achievement that even high teaching quality could not overcome. However, the report’s conclusions about teacher quality’s small influence are dubious as even the authors concede that “it should be noted that many characteristics of teachers were not measured in this survey; therefore, the results are not at all conclusive regarding the specific characteristics of teachers that are most important” (Coleman et al., 1966, p. 22). Despite this concession, which is easily overlooked as it is buried within a document that is hundreds of pages long, the report raised questions about how much teachers could really impact students (Hanushek & Rivken, 2007). Strong criticism of the Coleman report spurred an era of substantial research on teacher effectiveness, much of which supports the idea that teacher education and experience are not strong predictors of quality teaching (Hanushek & Rivkin, 2007).

Despite the fact that neither teacher education nor experience alone reliably predict teacher effectiveness, some studies do show that combined measures of teachers’ education and experience explain student achievement scores, though the magnitude and consistency of the relation is debatable (Darling-Hammond, 1999; Early et al., 2007). Notwithstanding research findings that aggregating traditional predictors occasionally predicts increased student achievement, evidence that either as a single predictor does not consistently or strongly relate to teacher effectiveness points to the need for more reliable predictors (Wayne & Youngs, 2003).

To clarify which variables are stronger, more consistent predictors, the following section will review research on variables cited as predicting teacher effectiveness. Recent
research points to the importance of reliable observer ratings of teachers’ classroom performance as a powerful measure of current and potential teacher effectiveness (Bill and Melinda Gates Foundation, 2013; Ferguson & Brown, 2000; Rimm-Kaufman & Hamre, 2010). Parsing the evidence on various factors influencing teacher effectiveness will improve accuracy of teacher effectiveness predictions. In the following subsection, literature on three ways of reflecting teacher effectiveness is reviewed: (1) traditional measures of teacher effectiveness—experience, education (achievement, degrees, and certification); (2) student test scores, and (3) teacher behaviors.

**Teacher Experience**

Research generally supports that teacher experience matters only when comparing novice and more experienced teachers. The relation between teacher experience and effectiveness is not always significant or linear (Boyd, Lankford, Loeb, Rockoff, & Wyckoff, 2008; Darling-Hammond, 1999; Hanushek & Rivkin, 2007). Teachers continue to improve over the first three to five years of their career, though most of their improvement in their ability to increase student academic achievement occurs in the initial teaching year (Boyd et al., 2008).

Research on the relation between teacher experience and quality is largely inconclusive and controversial (Hanushek & Rivkin, 2007). Some studies find that experienced teachers are generally more effective than novice teachers (defined as those with fewer than three years of experience). However, this is not always the case--other studies show that highly prepared novice teachers can be as effective as more senior teachers. Furthermore, methodological issues arise in studies of teacher experience
because more senior teachers tend to be in schools with higher achieving students. This situation raises the question of whether these teachers are labeled more effective because of actual teaching practice or because of the fact that they teach high-achieving students (Hanushek & Rivkin, 2007).

What is known is that novice teachers are usually less effective than the teachers they will become (Hanushek & Rivkin, 2007). Teachers gain significant teaching ability in their initial years of teaching, but their improvement tends to level off by the fifth year of teaching (Darling-Hammond, 1999; Hanushek, 1986; Hanushek & Rivkin, 2007). Noteworthy in the context of the current study is that many educators and researchers cite a lack of high quality, ongoing professional learning and development opportunities as a main reason that experienced teachers do not continue to demonstrate measurable performance growth (Darling-Hammond, 1999). Teacher participation in quality PLCs is one proposed solution to teacher stagnation.

**Teacher Test Scores**

Some research suggests that teachers’ test scores relate to their teaching effectiveness (Darling-Hammond, 2006; Ferguson & Brown, 2000; Strauss & Sawyer, 1986; Wayne & Youngs, 2003). An early study by Strauss and Sawyer (1986) found that a 1% increase in teacher effectiveness (measured by teachers’ National Teaching Exam scores) resulted in a 5% decline in the percentage of students failing their high school competency exams. Similarly, a literature review by Wayne and Youngs (2003) showed that teacher test scores generally correlate with higher student achievement gains. They reviewed 21 studies of the relation between the characteristics of teachers and the
standardized test scores of their students. Seven of those reviewed studies examined the relation between teacher test scores and students’ academic achievement. The researchers included only studies that took into account student prior achievement and student SES. Five of the seven studies found positive relations between teachers’ test scores and student achievement but two of the seven studies found negative relations. However, Wayne and Youngs note that the two studies that found negative relations both control for the ratings of the colleges those teachers attended. College ratings might capture a dimension of teacher effectiveness similar to that of test scores as high-achievers are possibly more likely to attend selective universities. Therefore, if college ratings are not already taken into account, teacher test scores likely matter.

Similarly, Ferguson and Brown (2000) endorse the continued use and improvement of teacher certification tests as a component of certification. They found that teacher certification exam scores positively relate to student achievement. Ferguson (1991) studied almost 900 school districts serving over 2.4 million students in Texas to determine correlates of student achievement. Although students’ socioeconomic status, particularly parental education, was very determinative of student achievement, he also found evidence supporting the importance of some traditionally researched teacher variables. Ferguson identified teachers’ performance on a statewide recertification exam as one of the strongest predictors of student achievement.

Intellectual ability has been shown to correlate with teaching performance but has not been used much as a predictor of teaching effectiveness. Decades of research support that general mental ability relates to performance for virtually all jobs (Barrick et al.,
Teaching is no exception. Some studies dating back nearly 70 years found positive correlations between teacher intelligence and academic ability and their teaching performance, but most relations were small and statistically insignificant (Darling-Hammond, 1999). Research showing a positive relation between teacher test scores and teacher effectiveness might actually be finding an association between intelligence and teaching quality. Because intelligence relates strongly to academic achievement, it is likely a covariate and possible confounding variable in research studies that find relations between teacher licensure test scores and teacher performance.

**Teachers’ Degrees**

Policymakers in particular often place much importance on teachers’ education. Indeed, public school teachers’ salaries are typically a function of years of service and educational attainment (Ballou & Podgursky, 2002). Some states require teachers earn Master’s degrees while others do not (Darling-Hammond, 1999). Not all educational research supports the current use of teacher degree attainment as a correlate of teacher effectiveness, with many studies being indeterminate on whether teacher degrees correlate with student achievement. Some studies that do show that more highly educated teachers improve student outcomes are balanced by other studies that find just the opposite (Bogard, Traylor, & Takanishi, 2008; Hanushek & Rivkin, 2007). Degree attainment alone does not appear to predict teacher effectiveness.

Despite evidence that teacher degrees do not necessarily predict quality teaching, evidence exists that specialized knowledge and training does relate to quality teaching. Teachers’ college course content is a better predictor of teacher effectiveness than is
degree attainment. The relationship between teacher content knowledge and student achievement is generally positive, particularly in high school mathematics achievement (Boyd et al., 2007; Nadelson et al., 2012). Students whose teachers majored in mathematics show more math improvement than students whose teachers do not have much mathematical background (Darling-Hammond, Holtzman, Gatlin, & Helig, 2005; Wayne & Youngs, 2003). Monk (1994) used a longitudinal design and calculated test score gain of 2,829 high school students who took the National Assessment of Educational Progress (NAEP) tests. He found that teachers’ degree level had either a zero or negative relationship to student achievement. Instead, he found teachers’ content knowledge and pedagogical content knowledge was significantly positive for student achievement (Monk, 1994). Degrees not directly related to the subject taught had no positive impact on teacher effectiveness (Monk, 1994). Examining teacher degree attainment without further inquiry into coursework paints an incomplete picture of the effects of teacher education on teacher effectiveness.

Although teachers’ subject matter knowledge correlates with their teaching performance, it turns out that extensive teacher subject matter knowledge is not strongly linked to teacher effectiveness (Darling-Hammond, 1999). In actuality, the relationship between teacher subject matter coursework and teacher effectiveness may be curvilinear—up until a certain baseline, teacher subject matter knowledge matters, but beyond that level, there are diminishing returns (Darling-Hammond, 1999). Monk (1994) found evidence of this relationship in his study of the effects of secondary math and science teachers’ subject matter knowledge on their students’ achievement. The students’
math and science teachers completed a general survey covering background information on undergraduate and graduate courses taken in various curriculum areas (Monk). Monk found a curvilinear relationship between teachers’ undergraduate math courses and their students’ performance. He found that beyond the five required math courses, each additional course beyond the fifth had a smaller effect on student performance compared with the effect of an additional math course up to and including the fifth course. Overall, although a certain amount of subject matter knowledge is certainly necessary for teachers, evidence is scarce that deep subject matter knowledge beyond certification requirements improves teacher effectiveness (Ferguson & Womack, 1993).

**Teacher Preparation and Certification**

For most of the 20th century, teacher candidates could be certified as long as they had completed a state approved teacher preparation program. The use of teacher tests in certification decisions was rare until the 1980s, but by 2002, 41 states used tests as part of initial certification (Wayne & Youngs, 2003). By the 1980s, several states implemented performance assessments for beginning teachers (Wayne & Youngs, 2003). Since the 1990s, many states have adopted standards from the Interstate New Teacher Assessment and Support Consortium and the National Council for Accreditation of Teacher Education in their certification decisions (Wayne & Youngs, 2003). State preparation programs’ requirements for teacher certification vary by state, but tend to require course content that includes subject matter knowledge, child development knowledge, and pedagogical knowledge (Boyd et al., 2007). Research tends to support that teachers with full certification (rather than emergency certification) have statistically significant
positive impacts on student test scores and that the effects on student academic achievement similar to the difference in having a brand-new versus more experienced teacher (Boyd et al., 2008; Darling-Hammond, 1999, 2006; Darling-Hammond, Holtzman, Gatlin, & Heilig, 2005).

Judging whether teacher certification relates to effective teaching is complicated by the fact that across the U.S., state certification requirements regarding degree, coursework, and assessments vary widely (Bogard et al., 2007; Boyd et al., 2008; Geis, & Griffith, 2005; Henke, Peter, Li, 2005). For instance, in 2001, California required all teachers to major in a content area—not in education—as undergraduates (Henke et al., 2005). They then had to complete an additional year beyond the bachelor’s degree focused on professional teacher training (Henke et al., 2005). Other states have certified teachers with a bachelor’s degree alone and are not as stringent about post-baccalaureate teacher preparation (Boyd et al., 2007; Henke et al., 2005). Therefore, studies that compare certification status alone are difficult to synthesize because cross-state comparisons are invalid.

Although degree attainment and experience alone might not guarantee increased teacher effectiveness, some researchers maintain that teacher preparation positively relates to teacher effectiveness (Darling-Hammond et al., 2005; Henke et al., 2005). Teacher preparation coursework might have more effect than teachers’ subject matter coursework (Boyd et al., 2007; Darling-Hammond, 1994). Previous studies examining the different aspects of teachers' math courses versus math methods courses find math methods courses are a stronger correlate of student performance (Darling-Hammond,
Monk (1994) found similar results in that beyond a certain baseline level of subject matter course work, teachers’ education coursework had a positive and sometimes greater effect than additional subject matter preparation. Teachers’ undergraduate math pedagogy courses had a statistically significant greater effect on student achievement than did teachers’ undergraduate math courses. Darling-Hammond (1999) suggests that pedagogical knowledge interacts with subject matter knowledge to increase or hinder teacher performance. One teacher characteristic the current study examines is teachers’ education.

Strong academic coursework, in conjunction with instructional methods courses and student teaching, relates to teacher retention. Those who start teaching without preparation in instructional methods or child development and learning theory leave the profession at twice the rate of those who are more prepared. New teachers with little to no student teaching experience do not last long in the profession. Studies show that half of the recruits from the Massachusetts MINT program left teaching within three years. Similarly, an average of 80% of Teach for America recruits left Houston, Texas, teaching jobs after two years (Darling-Hammond & Sykes, 2003).

To examine how teacher preparation and certification relate to teacher effectiveness, Darling-Hammond et al., (2005) conducted a large-scale longitudinal study using a large Houston database covering the school years 1996-97 through 2001-02 that allowed them to link teacher certification data to students’ background and achievement data for 132,071 students and their 4,408 teachers. They categorized teachers into three groups: (1) TFA uncertified teachers, (2) non-TFA uncertified teachers, and (3) fully
certified teachers. TFA uncertified teachers represented teachers who did not receive any teacher preparation coursework and had not fulfilled certification requirements (certification testing and enough years teaching to pass the probationary period). The second group of teachers had completed teacher preparation coursework but had either not taken/passed certification tests and/or taught long enough to gain full certification. The third group of teachers was fully certified. Outcome variables were student gain scores in mathematics and reading on three separate state standardized tests—the Texas Assessment of Academic Skills (TAAS), the Stanford Achievement Test, version 9 (SAT-9) and the Aprenda. Darling-Hammond et al. (2005) used Hierarchical Linear Modeling to run their analyses and controlled for: (1) students’ prior achievement and demographic characteristics, (2) teachers’ years of experience and highest degree completed and (3) school-level demographics.

Findings regarding TFA recruits were generally unfavorable. Descriptive data showed teacher certification related to teacher attrition and that TFA attrition rates were about twice as high as for non-TFA teachers. Researchers found that TFA teachers left the profession at high rates: depending on the year, between 57% and 90% of TFA recruits left their Houston jobs after their second year and between 72% and 100% of TFA recruits had left after their third year. In contrast, newly hired non-TFA teachers’ attrition rates ranged between 32% and 55% after three years. Regarding influence upon student achievement, the researchers found TFA teachers had positive significant effects only for two school years and only on the TAAS math tests. These two school years were the years when that particular TFA cohort was better qualified than other TFA cohorts:
73% of TFA teachers in that cohort had standard teaching certification as compared to only 65% of other Houston teachers. In the following year, only 48% of TFA recruits held standard certification whereas 68% of other Houston teachers held standard certification. In two of the six study years, TFA coefficients were significant and negative in reading and by the 2001-2002 school year, the TFA coefficients were significant and negative across all tests (Darling-Hammond et al., 2005). Overall, teachers without certification or with non-standard certification were less effective in raising student test scores than teachers with standard certification. Teacher certification status effects were generally much stronger than the effects of teacher experience. On all tests but one, the negative effect of having an uncertified TFA teacher was greater than the negative effect of having an uncertified non-TFA teacher, depressing student achievement by between half a month and three months annually compared to a fully certified teacher. Non-TFA uncertified teachers had negative effects on four of the six tests and insignificant effects on the other two tests compared to standard certified non-TFA teachers. Darling-Hammond et al. (2005) concluded that teachers’ ability to support student academic achievement considerably depends on their preparation level.

Many researchers argue that merely mandating higher levels of teacher education does not guarantee better student outcomes, but this does not mean that teacher education does not matter. Wayne and Youngs (2003) point out that possible predictors of teacher effectiveness cannot be dismissed as unimportant if a number of study criteria are left unmet. To be able to make valid, accurate inferences from studies’ results, those studies should include large sample sizes, keep measurement error low, and establish that
multicollinearity is not a problem. Using experimental design with random assignment of study participants is also critical. Wayne and Youngs assert that no such research examples appear in the literature and therefore, statements that teacher education level does not matter are invalid. For instance, studies that show that teachers’ Master’s degrees do not improve their effectiveness suffer from the fact that most teachers with Master’s degree have more teaching experience. In this case, multicollinearity could be an issue. Parsing the influence of study variables on outcomes of interest is challenging.

Although teacher degree attainment alone might not predict teacher effectiveness, this should not necessarily be understood to mean that teacher preparation and certification do not matter for teacher effectiveness. Specific sorts of preparation (student teaching experience, pedagogical content knowledge) likely do matter, but it is difficult to design experimental studies where these variables can be isolated from confounding variables to examine how each influences teacher effectiveness. Darling-Hammond (2005, 2006) is particularly outspoken about the need for strong teacher preparation programs. This might be especially important in states with higher proportions of English Language Learners (ELL). Darling-Hammond et al. (2005) found in their research on TFA teachers that uncertified teachers fared particularly poorly when it came to improving ELLs’ achievement. This point gets back to the assertion that many researchers make that poor and minority children must be served by highly qualified and effective teachers. Continuing the status quo where these students are served frequently by less qualified teachers is not acceptable.
The research on traditional teacher effectiveness measures shows that in some cases, the effects of education (coursework matching to teaching area, for instance) and experience (a brand-new teacher versus one who has been teaching for five years) may be positive, but the magnitude of the effects is small, making any of these predictors not very useful (Boyd et al., 2006; Darling-Hammond & Sykes, 2003). Some research supports that looking at all three variables—experience, education, and certification—in aggregate can be useful (Darling-Hammond, 1999; Ferguson, 1991), but because of multicollinearity, the validity of this approach is also questionable. Multiple factors are involved in teachers being effective—content knowledge, pedagogical knowledge, and pedagogical content knowledge—and these factors cannot be explained by looking at a single predictor. Educators, researchers, and policymakers need better predictors—and measures—of teacher effectiveness.

**Students’ Test Scores**

The best and most precise method of attributing student achievement to specific teachers is a matter of considerable debate (Hanushek & Rivkin, 2010). Many policymakers, educators, and researchers argue that teacher effectiveness should be measured by the amount of student learning a teacher imparts, as measured by test scores (Darling-Hammond, 2013; Hanushek & Rivkin, 2007; Harris, 2011). However, even those who advocate for the use of student test scores as teacher effectiveness measures acknowledge the difficulty in identifying exactly how much students’ learning is a reflection of their teachers’ quality rather than family and/or other factors (Boyd et al., 2007; Darling-Hammond, 2013; Hanushek & Rivkin, 2007; Harris, 2011). Furthermore,
classroom sorting and selection introduces bias and error into teacher effectiveness measures (Boyd et al., 2007; Harris, 2011). This is a particularly important weakness in using student test scores to measure teacher effectiveness because many schools, for reasons like ease of service delivery for special education, ESOL, and gifted education teachers, sort students into classrooms based on the students’ prior achievement.

In his analysis of how classroom sorting impacted teacher effectiveness, Rothstein (2010) found that the standard deviation of bias could be near 20%. Although researchers can mitigate the effects of sampling error on teacher effectiveness estimates, such error inevitably leads to some successful teachers being classified as ineffective and some ineffective teachers being classified as effective (Hanushek & Rivkin, 2010; Popham, 2010). In the current high-stakes environment, using student test scores needs continued scrutiny.

Many experts question whether value-added measures are an appropriate and valid tool in identifying and developing teacher effectiveness, especially as surprisingly few studies have attempted to validate value-added measures (Corcoran, 2010; Harris, 2011; Rothstein, 2010). Using student test score gains to delineate teacher effectiveness makes theoretical sense, but it is very difficult to do it in a way that renders valid conclusions drawn from student data (Harris, 2011). Although it is widely believed that standardized educational tests are accurate, they are much less precise than is thought (Popham, 2010). Popham (2010) defines a standardized test’s "instructional sensitivity” as the degree to which students' performance on that test accurately reflects the quality of instruction provided to promote students' mastery of the assessed materials.
Instructionally sensitive tests are capable of tapping students’ school learning—i.e., they have adequate construct validity. Most standardized tests used in schools today are instructionally insensitive and therefore supply misleading evidence about the quality of schooling and lead to inappropriate instructional decisions (Popham, 2010).

In light of current difficulties in using test scores to measure teacher effectiveness, the next best option is to use classroom observations of teachers by trained raters. Effective teachers use strong instructional practices that enable a wide range of students to learn (Darling-Hammond, 2013; Pianta et al., 2008). These differences are discernible to trained observers (Bill and Melinda Gates Foundation, 2013; Darling-Hammond, 2013; Hanushek & Rivkin, 2010; Pianta et al., 2008).

**Teacher Behaviors**

Many researchers and educators support the use of teacher observations as measures of teacher effectiveness (Bill & Melinda Gates Foundation, 2013; Darling-Hammond, 2013; Smolkowski, & Gunn, 2012). Certain classroom behaviors have been associated with student achievement (Bill & Melinda Gates Foundation, 2013; Darling-Hammond, 1999; Ferguson & Brown, 2000; Pianta et al., 2008). Effective teachers are creative and use a range of instructional strategies and interaction styles (Darling-Hammond, 1999). Teacher enthusiasm, task-oriented behavior, different lesson styles, feedback use, and higher order questioning have been linked to student learning (Darling-Hammond, 1999). Highly effective teachers use intentional instruction to engage in frequent positive and responsive interactions with students (Burchinal, Vandergrift, Pianta, & Mashburn, 2010).
Studies have related the *Classroom Assessment Scoring System (CLASS)* with student outcomes, supporting its use as a teacher effectiveness measure, particularly for prekindergarten through early elementary grades (Hamre & Pianta, 2005; Hamre, Pianta, Mashburn, & Downer, 2007; Hamre et al., 2012). Studies using this measure have shown that teachers rated as high in interaction quality have students with better social and academic outcomes (Burchinal et al., 2010; Curby, Brock, & Hamre, 2013; Pianta & Hamre, 2005). For instance, Hamre et al. (2007) report the instrument’s emotional support domain has been associated with student standardized test score gains in early literacy for preschoolers and first graders. Studies have shown that across several elementary grades, teachers who were more emotionally supportive had increased student engagement and for kindergarteners and first graders, fewer internalizing behavior problems as reported by the students’ mothers (Hamre et al., 2007). Instructional support consistently predicts students’ preschool academic functioning and first grade school engagement (Hamre et al., 2007).

In another study, Hamre and Pianta (2005) used a large dataset to investigate the association between teacher classroom behaviors and student achievement in first grade. Participants were 910 first-graders and their teachers. Some children were identified as at-risk based on demographic characteristics and kindergarten teacher-reported behavioral problems. The teacher effectiveness measure used was the *Classroom Observation System (COS)*, a precursor to the CLASS. The student outcome measure was student scores on the *Woodcock Johnson Psycho-educational Battery-revised*. The researchers found that at-risk students whose teachers were rated as moderately to highly
effective teachers in establishing instructional support (as rated by the COS) had similar academic achievement to their non-risk peers. In contrast, at-risk first-graders whose teachers rated low in instructional support achieved at statistically significant lower levels (Hamre & Pianta).

This study is based upon the view that teachers’ classroom behaviors are a valid, reliable measure of teacher effectiveness. Personality is used to explain and predict behavior in other occupational fields, so examination of personality’s role in predicting teacher effectiveness is thus an important step in identifying its value in predicting effectiveness. Because the CLASS has been identified as a reliable observation measure of teacher classroom behaviors, assessing personality measures’ utility in predicting such behavior would be an important piece of the puzzle when it comes to solving what predicts effective teaching. Using the CLASS as the teacher observation instrument avoids potentially invalid conclusions and reduces study limitations (Pianta, La Paro, Hamre, 2008).

**Personality**

Many definitions of personality exist (Mount, Barrick, Scullen, & Rounds, 2005). Mount et al. (2005) base theirs on definitions of personality theorists such as Allport, Hogan, McCrae, and Costa. They describe personality as referring to stable psychological traits that provide reasons for a person’s behavior (Mount et al., 2005). Although this is a clear and useful definition, it is too narrow for the current study. Instead, the definition used for the current study is based on the definition provided by Costa, McCrae, and Kay (1995), who describe personality as a person’s “relatively enduring styles of thinking,
feeling, and acting” (p. 124). This definition fits this study because the study examines not only teacher behavior (measured by the CLASS) but also personality’s relation to teacher perceptions of the PLC’s quality.

A brief history of personality research provides an important foundation for understanding why we still have much to learn about personality’s role in behavior prediction. The first personality inventory (the Woodworth Personal Data Sheet) was developed during World War I to identify recruits who might be susceptible to wartime stress (Mount & Barrick, 1995). In the 1920s, several tests designed to measure personality attributes were introduced (Mount & Barrick, 1995). In the 1930s, self-report multi-trade inventories appeared, spurring research investigating the validity of such inventories (Mount & Barrick, 1995). These developments were important because they led to the availability of normative data and provided initial evidence about the link between personality traits and performance in different contexts (Mount & Barrick, 1995). The best example of this is early studies that used the Minnesota Multiphasic Personality Inventory (MMPI), developed in 1940 (Mount & Barrick, 1995). After World War II, personality inventories’ use was widespread, particularly in the military. By 1954, personality measures were so popular that 60% of U.S. companies used personality inventory in hiring decisions (Mount & Barrick, 1995).

Although personality measures enjoyed a strong start in their utilization for personnel selection, this ended in the mid-20th century. Research emerging in the 1950s and 60s on the validity of personality measures for personnel selection purposes was generally unimpressive (Mount & Barrick, 1995). By the mid-1960s, the pessimistic
conclusions of a number of these research studies led to a dramatic decrease in research investigating the validity of personality constructs (Hurtz & Donovan, 2000). Additionally, the person-situation debates (whether a person’s tendencies and characteristics explain behavior better than situational factors) that have plagued psychology on and off for 100 years surged forward with Mischel’s (1968) critique that traits were poor predictors of behavior and that situational factors are more useful in explaining individual differences in behavior (Flett, 2007; Roberts, 2006). These influences combined to create a few decades (late 1960s into the 80s) when the study of personality traits almost disappeared (Mount & Barrick, 1995; Roberts, 2006). The personality-situation debate has been put to rest now with numerous studies demonstrating the stability of personality traits as well as their utility in behavior prediction, leading to a resurgence in the use of personality measures for predicting job performance (Mount & Barrick, 1995; Roberts, 2006).

An important component of trait psychology’s successful return was broad agreement that personality traits are best represented by a five factor model (FFM) (Corr & Matthews, 2009; Flett, 2007; McCrae, 2011; Mount & Barrick, 1995). One of the fundamental problems of personality psychology had been developing a parsimonious yet comprehensive model of personality. From the early 20th century onward, many theorists developed personality inventories that included more than five personality structures, but later research on these measures identified five dimensions (Mount & Barrick, 1995). The FFM dates back to work by Fiske in the 1930s, but like many scientific theories, it took
decades of different researchers reexamining and testing it for the five factor theory to be widely accepted, as it is today (Wiggins, 1996).

Many studies have found that personality traits are best represented by five factors. At least five research studies using factor analysis to examine Cattell’s (1947) 16 factor personality structure recovered five factors (Mount & Barrick, 1995). Norman played an important role in the emergence of the five factor model, advancing the argument for inclusion of Conscientiousness as one of the traits (Flett, 2007). Norman and his colleagues analyzed adjectives found in other personality measures and confirmed the presence of five overarching factors (Flett, 2007). Independently, Tupes and Christal detected five factors and comparable results were later obtained in an investigation by Digman and Takemoto-Chock (Flett, 2007). Goldberg coined the term “the Big Five” to refer to the FFM (Flett, 2007). Meanwhile, Costa and McCrae set out to develop a personality scale to measure the five factors, developing the highly influential NEO PI-R (Archer, 2000; Flett, 2007). There are now over 30 translations of the NEO PI-R or NEO FFI, supporting its universal applicability—as Costa and McCrae (2000) write, in the 21st century, personality research is “a vigorous international enterprise” (p. 326). It is time to more fully test its utility in education research and teacher effectiveness prediction.

Although differences in labeling the five traits exist, the meaning of the dimensions and the differences are minor. Costa and McCrae’s labels of Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism are the most accepted labels (Mount & Barrick, 1995).
Little doubt exists that the FFM is currently the dominant paradigm in personality research (McCrae, 2009). Openness to Experience describes a person’s tendency to be creative, artistically sensitive, and seek out new experiences (McCrae & Sutin, 2007; Waldman et al., 2004). Individuals low in Openness to Experience tend to be traditional, conservative, and prefer the familiar (McCrae & Sutin, 2007). Conscientiousness refers to a person’s tendency to be dependable, act purposefully and control one’s behavior to achieve a goal. A person low in Conscientiousness tends to be disorganized, unreliable, and undisciplined (McCrae & Sutin, 2007; Waldman et al., 2004). People high in Extraversion tend to prefer intense and frequent interpersonal interactions, and are energetic and optimistic (McCrae & Sutin, 2007). Extraversion describes a person’s tendency to be sociable, gregarious, assertive, talkative, and active (Waldman, Atwater, & Davidson, 2004). People who score in the low range in Extraversion tend to be reserved and prefer a few close friends rather than a large group of people (McCrae & Sutin, 2007). Agreeableness describes a person’s tendency towards being cooperative, forgiving, and good-natured (Waldman et al., 2004). Individuals who score in the low range in Agreeableness tend not to be as concerned for other people and can be antagonistic and hostile (McCrae & Sutin, 2007). Neuroticism is a person's tendency to experience emotional distress, have unrealistic ideas, and problematic urges (McCrae & Sutin, 2007). People low in Neuroticism are emotionally stable, unflappable, and not prone to depression (McCrae & Sutin, 2007). The NEO PI-R further disaggregates the five personality factors into more detailed facets, which might be even more useful in exploring the personality-teacher effectiveness connection than simply looking at broad
personality dimensions (Emmerich, Rock, & Trapani, 2006). (Please see Table 1 for FFM factor descriptions and each factor’s six associated facets.)
Table 1

*FFM Factor Descriptions and Associated Facets*

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<th>Factor</th>
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<tbody>
<tr>
<td>Openness to Experience</td>
<td>Intellectually curious, imaginative, sensitive to aesthetics and inner feelings.</td>
<td>Fantasy, Aesthetics, Feelings,</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Thorough, dependable, persevering, sometimes referred to as <em>will to achieve.</em></td>
<td>Competence, Order, Dutifulness, Achievement-striving, Self-discipline, Deliberation</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Sociable, assertive, gregarious, warm, active, and talkative.</td>
<td>Warmth, Gregariousness, Assertiveness, Activity, Excitement-seeking, Positive emotions</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Sensitive to others, cooperative, soft-hearted, straightforward and trusting;</td>
<td>Trust, Straightforwardness, Altruism, Compliance, Modesty, Tender-mindedness</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Susceptible to experiencing negative affect such as anxiety, sadness, embarrassment, anger, guilt, and disgust.</td>
<td>Anxiety, Angry hostility, Depression, Self-consciousness, Impulsiveness, Vulnerability</td>
</tr>
</tbody>
</table>

Research shows that personality is universal and highly stable, making it a powerful predictor (Costa, Herbst, McCrae, & Siegler 2000; McCrae, 2009). The FFM’s universality is explained by its biological roots, including the five factors’ high heritability (McCrae, 2009). Twin studies have shown that the five factors reflect the structure of underlying genes. By this explanation, warmth and assertiveness are both definers of Extraversion because they are influenced by the same genes (McCrae, 2009).

The biological base of personality factors helps explain study results finding personality’s stability across the adult lifespan. In a longitudinal study involving 2,274 participants of the University of North Carolina alumni Heart Study, Costa et al. (2000), examined personality stability in midlife, even in response to major life events. They found that personality is highly stable, with only slight decreases in Neuroticism, Extraversion, and Openness to Experience. In general, life events influenced personality traits very little: the only life events that had any impact on personality were being fired from a job or divorce (Costa et al., 2000).

The five factor model provides many advantages for the study of personality (Barrick & Mount, 1991; Mount & Barrick, 1995; McCrae, 2011; Salgado, 1997; Unruh & McCord, 2010). First, it is parsimonious. Second, it is comprehensive, reflecting cumulative and integrated research findings showing that five factors cover humans’ important personality traits (Mount & Barrick, 1995). Third, it has been repeatedly shown to predict behavior in a variety of contexts, including job performance. Some researchers
emphasize this latter point as being the most significant advantage of the FFM—improving behavior prediction, particularly work performance (Mount & Barrick, 1995).

However, when it comes to studying how personality traits predict job performance, research in the education field lags behind that of other professions. University teacher education faculty often debate if certain personalities are more well-suited to teaching and if great teaching can be predicted (Unruh & McCord, 2010; Watts, Cage, Batley, & Davis, 2011), but empirical evidence to support such hypothesizing is lacking. A purpose of this study is to answer whether a well-established personality measure, the *NEO Personality Five Factor Inventory-3 (NEO FFI-3)*, can predict which teachers will exhibit effective teaching behaviors.

The *NEO Personality Inventory Revised (NEO PI-R)* is regarded as an outstanding personality measure (Archer, 2000). The *NEO PI-R* is so well-regarded that one researcher likened its innovation and the paradigmatic shift it caused to groundbreaking events like Lewis and Clark's journey and Watson and Crick's discovery of DNA's structure (Archer, 2000). Chiefly, the emergence of the FFM resolved two long-standing problems in measuring personality. First, it specified the number of important personality factors—five. Eysenck's two and three factor models were insufficient and Cattell's 16 factor model was needlessly complex (Barrick & Mount, 1991; McCrae, 2011). Second, the *NEO* unified a host of different concepts that turned out to be different forms that could easily be classified in the FFM (McCrae, 2011). McCrae and Costa's (1996) *NEO PI-R* is currently found more often in scholarly articles than the 16 Personality Factor (16PF) or the California Psychological Inventory (Patrick,
Most psychologists use the FFM to study how personality relates to characteristic human adaptations: habits, skills, attitudes, beliefs, roles, relationships, and self-concept (McCrae, 2011). This study is no exception and uses the NEO FFI-3, a shortened version of the NEO PI-R, to study teacher skills, beliefs, and relationships.

Although personality measures are used in many organizations as a tool for employee selection and have been shown to be excellent predictors of important work-related variables in some fields, there is a dearth of valid, reliable research on personality traits’ utility in predicting teacher effectiveness (Harris & Rutledge, 2010). Personality measures have also been used to study leadership and performance of emotional tasks such as work that uses emotional labor and emotional regulation (O’Boyle Jr., Humphrey, Pollack, Hawver, & Story, 2011). Although it is likely that these study results would translate to teaching, undoubtedly a very emotionally laborious job, explicit research on this connection is needed. This study examines personality’s role in predicting teacher effectiveness and PLC quality, so a review of personality research on job performance and group performance as well as personality in the educational setting, is warranted. The following section presents a brief review of personality research in three areas: 1) job performance, 2) group performance, and 3) teaching.

**Job Performance**

Not until the end of the 20th century did personality research support the use of personality measures for job performance prediction (Barrick & Mount, 1991; Hurtz & Donovan, 2000; Mount & Barrick, 1995; Rushton, Morgan, & Richard, 2007). A number of researchers provided negative evaluations of the validity of personality measures in
personnel selection in the 1960s. Most notably, Guion and Gottier (1965) reviewed existing personality measures and concluded: “there is no generalizable evidence that personality measures can be recommended as good or practical tools for employee selection” (p. 159). They suggested a number of possibilities why personality measures did not reliably predict job performance, including carelessness of research design, poor choice of study variables, and lack of coherent theory and hypotheses about personality’s effects on job performance. Other research in the 1960s supported Guion and Gottier’s conclusions (Hurtz & Donovan, 2000).

The tide of negative research findings turned in the late 20th century with the advent of the FFM, particularly with the publication of four meta-analyses in the 1990s that provided strong evidence that the five factor model has utility for employee selection for a variety of jobs (Emmerich, Rock, & Trapani, 2005; Hurtz & Donovan, 2000; Patrick 2011; Salgado, 1997). Now, personality tests are a main way many employers make selection decisions (Morgeson et al., 2005). Each of the seminal meta-analyses is described below.

Barrick and Mount (1991) produced one of the first meta-analytic reviews of the validity of the FFM of personality in predicting job performance. They examined 117 published and unpublished criterion-related validity studies from 1957 to 1988 that used personality measures to predict job performance. The researchers used scales from all the personality inventories used in the 117 studies to classify all measures into the five FFM factors or a sixth miscellaneous classification. They examined five occupational categories: professionals (attorneys, teachers, doctors, etc.), police, managers (foremen to
top executives), sales persons, and skilled/semi-skilled workers (clerical, flight attendants, truck drivers, etc.). Three performance outcomes were studied: job proficiency (performance ratings as well as productivity data), training proficiency (training performance ratings and productivity data such as work samples and completed training), and personnel data (data for employee files including salary level, turnover, status change and tenure). Barrick and Mount found that Conscientiousness was the only factor that significantly predicted performance for all five occupations. Extraversion significantly predicted performance for the two occupations involving interpersonal skills--managers and sales representatives. Conscientiousness also predicted – though less significantly – all three job performance outcomes. The only other job performance outcome for which personality factors were significant predictors was training proficiency, for which Extraversion and Openness to Experience were significant predictors.

Also in the early 1990s, Tett, Jackson, and Rothstein (1991) published a meta-analytic review assessing the five factors’ validity in predicting job performance. Using somewhat different procedures, Tett et al. generally confirmed Barrick and Mount’s (1991) results, actually finding even greater support for the use of personality measures in personnel selection. However, some of their results differed in that they found Agreeableness had the highest correlation followed by Openness to Experience, Neuroticism, and Conscientiousness. One reason for the difference in findings about the predictive value of the five factors is that Tett et al. used a smaller number of studies and had smaller sample sizes. They also confined themselves to studies in which the
researchers used confirmatory rather than exploratory strategies (Mount & Barrick, 1995). Tett et al. averaged validities differently than Barrick and Mount (1991). Despite uncovering differences in which factors hold the most predictive value, Tett et al.’s study nonetheless corroborated the five factor model’s utility in predicting job performance.

In their conclusions and calls for future research, Tett et al. (1991) made salient points still applicable today. They called for using only well-established personality measures for personnel selection. They found that many studies used personality measures that did not have cogent psychometric evidence to justify their use. Tett et al. advised caution in the selection of personality measures. My search for studies in which teachers were participants confirms Tett et al.’s finding that too many unreliable personality measures are used. The full potential of personality measures in predicting teacher effectiveness will only be realized when researchers employ clear study design using only personality measures with psychometrically sound properties.

Mount and Barrick (1995) conducted a meta-analysis of 173 studies but focused their research on Conscientiousness and two subscales of achievement and dependability. (Although Mount and Barrick did not use the NEO terminology, the two subscales they examined are similar to the NEO Conscientiousness facets of achievement-striving and self-discipline.) They focused on Conscientiousness alone because of the emerging research that this factor consistently relates to numerous job performance criteria across different occupations. To investigate whether the validity of personality measures is affected by criteria specificity, they examined nine dimensions of performance that consisted of two categories: (1) overall performance, including overall job proficiency
and training proficiency and (2) specific performance measures including technical proficiency, employee reliability, effort, quality, administration, interpersonal orientation, creativity, and combat effectiveness (for their military samples). One of their research questions was whether better prediction occurred at the factor level (Conscientiousness) or at a subscale level (achievement or dependability). They found Conscientiousness actually predicted specific criteria as well or better than achievement and dependability. This finding lends support to the argument that studying factors alone, rather than facets as well, is sufficient for job performance prediction.

A second research question concerned aligning global versus specific variables—for example, whether a subscale of Conscientiousness would better predict a subscale of job performance (rather than overall job performance). The researchers found that facets of Conscientiousness predicted specific job performance subscales better than overall job performance. For my study, this might mean that the Extraversion facet of warmth might be a better predictor for positive climate than the Extraversion factor would. Nonetheless, the incremental gain and validity for each subscale relative to Conscientiousness was relatively small, so using factors rather than facets as job performance predictors is a sound methodological decision. Interestingly, Mount and Barrick (1995) explicitly address this issue of whether to use factors or facets in studies of job performance and state that if the study’s purpose is to predict overall job proficiency, using the factors is sufficient.

Salgado (1997) conducted a meta-analysis on the same topic of predicting job performance using a European sample instead of a North American sample. After
applying his exclusion criteria, he examined 36 studies, finding results similar to Barrick and Mount’s (1991) meta-analysis. He studied the same groupings as Barrick and Mount, looking at five occupational categories (police, professionals, managers, salespersons, and skilled labor) and three job performance outcomes (overall job rating, training proficiency, and personnel data). For the five occupations, Conscientiousness showed predictive value for all occupations. Neuroticism predicted performance for all occupations except sales. Agreeableness predicted performance for all occupations except police. Extraversion predicted manager and police performance, and Openness to Experience predicted performance for police and skilled labor. For the three job performance outcomes, Conscientiousness and Neuroticism emerged as valid predictors across all three job performance outcomes. Openness and Agreeableness predicted training proficiency. Extraversion did not predict any criteria, but Salgado hypothesized that the reason for this was that only three of the 36 studies he examined measured Extraversion. Salgado (1997) called for the use of further reviews and meta-analyses of studies that explicitly use fully big five measures to further clarify the association between the five factors and job performance.

Taken together, these four 1990s studies by Barrick and Mount (1991), Tett et al., (1991), Mount and Barrick (1995), and Salgado (1997) provide strong support for the predictive value of the five factor model in job and training performance. In particular, Conscientiousness and Neuroticism emerged as strong consistent predictors across occupations and job performance outcome (Alessandri & Vecchione, 2012). However, for some occupations, particularly interpersonally demanding ones, the other three factors
also demonstrate predictive value. This suggests that all five factors might predict teacher
effectiveness. Conscientiousness, Neuroticism, Openness to Experience and
Agreeableness emerged as predictors of training proficiency. Evidence for the predictive
value of Extraversion for training was mixed. These studies set the stage for the
confirmatory research studies that followed, all of which largely support conclusions of
the four 1990s studies.

One important limitation of the 1990s meta-analyses is construct validity.
Because many studies in the meta-analyses did not overtly measure the five factors, there
is the question of how well the predictors mapped onto the five factors. To provide
additional confirmatory evidence about the value of the five factor model in predicting
job performance, Hurtz and Donovan (2000) completed a meta-analytic study that used
actual FFM measures, a research task Salgado (1997) had recommended.

Consistent with the prior meta-analyses, Hurtz and Donovan examined
occupation type as well as job performance outcomes. For occupational category, they
examined four occupations: salespersons, customer service representatives, managers,
and skilled/semiskilled workers. For performance outcomes, they examined job
proficiency and training proficiency. For all but skilled/semiskilled workers,
Conscientiousness provided high predictive value, particularly for sales and customer
service jobs. Neuroticism also predicted performance in all five job categories, though
not as strongly as Conscientiousness. For managerial jobs and sales jobs, Extraversion
also predicted performance. For customer service jobs, Agreeableness, and Openness to
Experience also predicted performance. Hurtz and Donovan hypothesized that in jobs
requiring interpersonal interactions, the relationship between personality and performance might be more complex and therefore call upon more factors to perform well. Extraversion and Agreeableness predicted training proficiency. Overall, their results were highly consistent with the original work of Barrick and Mount (1991) and showed that Conscientiousness again had high validity in predicting overall job performance. Neuroticism also showed consistent although low levels of prediction. Hurtz and Donovan found that using specific job performance criteria did not result in stronger prediction than simply analyzing overall job performance. Hurtz and Donovan concluded that Conscientiousness can be expected to consistently explain variance, even a small amount of variance, in job performance across occupations and across performance outcomes. For certain occupations, (e.g., those requiring interpersonal skills), and for certain criteria, (e.g., training proficiency), other factors such as Agreeableness, Neuroticism, and Openness to Experience will likely add a small but consistent degree of explained variance.

In sum, results of multiple meta-analyses conducted in the previous two decades show that Conscientiousness and to a lesser extent, Neuroticism, predict job performance across various occupations (Alessandri & Vecchione, 2012). For some jobs, Extraversion, Openness to Experience, and Agreeableness also predict job performance. For job training proficiency, all five factors have shown predictive value. These findings point to the possibility of personality factors predicting teacher effectiveness and PLC quality.

In the current study, I hypothesize that all five factors will predict teacher effectiveness. Conscientiousness includes the characteristics of determination, planning,
and will to succeed. Effective teaching undoubtedly requires much planning and forethought, and teachers inclined to be Conscientious are most likely to succeed.

Openness to Experience likely influences lesson planning, as teachers higher in this factor might be more creative instructionally. Extraversion and Agreeableness will predict teacher effectiveness because teaching requires high interpersonal skills. Low Neuroticism will predict teacher effectiveness because many aspects of teaching require teachers regulate their own emotions and exhibit positive affect.

I also hypothesize that Openness to Experience, Agreeableness, Extraversion and Neuroticism will predict PLC quality. Openness to Experience might facilitate effective lesson planning (learning orientation subscale) and listening to others’ viewpoints (collegiality). Barrick and Mount (1991), in discussing their findings that Openness to Experience predicted employees’ training proficiency, theorized that individuals who are more open-minded and curious are more likely to be receptive to training. This parallels many demands teachers face, such as collaborating in working toward common goals and participating in myriad meetings and activities. Similarly, teachers high in Agreeableness might be more likely to have positive views of their school’s faculty interactions. A negative correlation between Neuroticism and teacher effectiveness likely exists. These correlations will be tested in the current study.

**Group Processes**

Because organizations are increasingly using work groups to increase efficiency and organizational performance, examining group characteristics that relate to group performance is critical (Felps, Mitchell, Byington, 2006). Hackman (1987, 2012)
emphasizes the importance of studying group process because inputs affect group outcomes through group interactions; therefore, group process should not be ignored.

Group member characteristics either benefit or hinder group process and in turn, group performance. The dominant way of thinking about groups is the input→process→output model (Barrick, Stewart, Neubert, & Mount, 1998; Hackman, 1987). The model theorizes that a variety of inputs combine to influence group output, via member interactions (Barrick et al., 1998; Hackman, 1987, 2012). Inputs have been grouped into three categories: individual factors (e.g., group member characteristics), group factors (e.g., structure and size), and environmental factors (e.g., task features and reward structures) (Barrick et al., 1998). Intragroup processes include group interactions such as communication patterns, personal disclosure, and conflict, and efforts at leadership and other forms of influence (Barrick et al., 1998). Output variables include the subsequent behavior and attitudes of individual group members, changes in the group as a social system, and group performance outcomes (Hackman, 1987).

In this study, the inputs examined are teacher background characteristics and personality traits. Group process is captured with the PLC quality measure and the output examined is teacher effectiveness. Figure 1 is a graphic representation of the input-process-output model for the current study, depicting my conceptualization of how teacher characteristics (background characteristics, personality factors, group composition) influences group processes (PLC quality) to influence teacher effectiveness. Different approaches to examining group personality exist. In the current study, group mean personality is examined as a predictor of teacher effectiveness. Although group
mean personality scores are often used, predictors also include individual minimum or maximum scores and factor variability within a group (Barrick et al., 1998; Bradley, Baur, Banford, & Postlethwaite, 2013; Felps et al., 2006).

\[
\text{INPUT: Teacher Characteristics} \rightarrow \text{GROUP PROCESS: PLC Quality} \rightarrow \text{OUTPUT: Teacher Effectiveness}
\]

\textit{Figure 1. The current study’s input $\rightarrow$ process $\rightarrow$ output model}

In an oft-cited study, Barrick et al. (1998) studied 652 employees in 51 work teams to investigate the relation between member ability and personality on the one hand, and work-team processes and team effectiveness on the other. The team composition inputs the researchers examined were general mental ability and the FFM of personality. The team process variables explored were social cohesion, team conflict, member flexibility, team communication, and workload sharing. However, the researchers ended up focusing their analyses of intragroup process on social cohesion. They made this decision for two reasons. First, all the other intragroup process variables were highly correlated with social cohesion. Second, the correlation results showed that the relation between the other process variables and team-composition measures were generally
similar to those found for cohesion. Cohesion emerged as an indicator of synergistic intragroup process through which some of the group composition characteristics operate. Based on Hackman’s (1987) proposition that measures of team success should capture both current team effectiveness and future team effectiveness, Barrick et al. examined present team performance as well as team viability (future effectiveness), both rated by team supervisors.

Results from Barrick et al.’s (1998) study align with studies relating personality to individual performance, in particular that teams with higher mean levels of Conscientiousness were rated as having better team performance. Higher mean levels of Extraversion and Emotional Stability (reversed Neuroticism) received higher ratings of team viability by supervisors. The researchers used hierarchical regression analyses and found no curvilinear relationship between personality factors and team performance. Barrick et al. (1998) also found that identifying each team's weakest link predicted teams’ performance and viability. A group’s minimum score of Conscientiousness, Agreeableness, Extraversion, and Emotional Stability robustly predicted team processes and performance. For example, a single group member who is highly disagreeable was associated with lower group performance, cohesion, conflict, less open communication, and less sharing the workload. This has powerful implications in the school environment where PLCs are theorized to significantly impact teacher effectiveness and stresses the importance of considering candidates’ personality composition when hiring as personality likely impacts PLC quality as well—I examine this question in the current study.
One way member personality likely affects a group is through “evocative processes” that affect group synergy (Roberts, 2006). People tend to evoke personality consistent responses from others (Roberts, 2006). For example, aggression typically invokes hostility from others, which convinces the aggressive person that the environment is hostile, reinforcing that person’s own aggressive tendencies (Roberts, 2006). Employers must therefore carefully attend to employee personality traits because adding a single aggressive person (high Neuroticism) to a group can cause deleterious effects (Felps et al., 2006). A group made up of too many high Neurotic, low Agreeable members would more likely be uncooperative and unproductive, negatively impacting both individual and organizational outcomes (Barrick et al., 1998; Felps et al., 2006). Despite the use of teaming in organizations, the association between individual personality traits and group performance generally has not been studied much in actual field settings (Barrick et al., 1998). The current research seeks to fill this gap by examining the relation between PLC personality composition, PLC quality, and teacher effectiveness.

Research supports the need to take group personality composition into account when explaining and predicting group performance. The studies discussed in this section provide guidance about how to proceed with analyses in the current study. Barrick et al.’s (1998) results that a team’s weakest link detracts from team effectiveness should be examined further as it possibly applies in the teaching field.
Teacher Personality

There is a paucity of reliable studies relating personality to teacher effectiveness. In education, personality has been used more frequently to examine job-related outcomes like job satisfaction, burnout, or isolation (Decker & Rimm-Kaufman, 2008; Rushton, Morgan, & Richard, 2007). Studies that do examine the relation between teacher personality and job outcomes do not use reliable, valid personality measures in conjunction with an objective job performance outcome with generalizable teacher populations that inform elementary education. Some studies focus on student teachers (Kokkinos, 2007; Teachout, 2001; Unruh & McCord, 2010). The high teacher attrition rate within the first years of teaching makes generalizability of studies of student teachers’ personality effects to veteran teachers extremely problematic. Others focus on college professors (Kneipp, Kelly, Biscoe, & Richard, 2010; Patrick, 2011; Teven, 2007). More empirical research of the relation between personality and early childhood teacher effectiveness is needed to assess the value of personality in predicting teacher effectiveness.

Studies that examine teacher personalities tend to relate personality to affective factors like teacher burnout and job stress. When the outcome measure of a teacher personality study is teacher performance, the outcome measure is often questionable (e.g., a short Likert scale completed by the principal, students’ course evaluations). Nevertheless, these studies provide hints of possible influence of teacher personality on teacher effectiveness. For instance, a study by German researchers Dormann and Kaiser (2002) examined the effects of 40 Kindergarten teachers’ personality on 102 of their
students’ parents’ satisfaction. The personality measure teachers completed was a 30 item bipolar adjective rating list (Dormann & Kaiser, 2002). Results showed that two factors—Extraversion and Conscientiousness—predicted parent satisfaction in teachers’ reliability, responsiveness, assurance, and empathy. Whether high parent satisfaction actually relates to better teaching is questionable, but an association between Extraversion and Conscientiousness and better teaching is believable in this case if reliability and responsiveness correlate to better teacher lesson planning and sensitivity and responsiveness.

Researchers in Spain studied the impact of teachers’ personalities on burnout (Cano-Garcia, Padilla-Munoz, & Carrasco-Ortiz, 2005). Researchers translated to Spanish and orally administered the NEO-FFI, a shortened version of the NEO PI-R, to assess personality. To measure teacher burnout, they used the Maslach Burnout Inventory (Cano-Garcia et al., 2005). Findings showed that teachers high in Neuroticism and low in Extraversion were more likely to score higher on burnout (Cano-Garcia et al., 2005).

Similarly, a South African study used the Eysenck Personality Questionnaire (EPQ) to measure 444 teachers’ personalities to assess whether personality correlated with certain dimensions of job stress as measured by the Occupational Stress Inventory for Teachers (OSIT) (Ngidi & Sibaya, 2002). Ngidi and Sibaya (2002) found that Neuroticism significantly predicted teacher stress caused by time pressures, administrative pressures, and student misbehavior. This is unsurprising as a facet of Neuroticism is vulnerability to stress (McCrae & Costa, 2010). They found that Extraversion significantly predicted lower stress levels in teachers facing educational
changes, meaning that extraverted teachers were more resilient to stress caused by changes in the education system (Ngidi & Sibaya, 2002). Although my study does not specifically measure job stress, the U.S. education system is currently undergoing many changes and these researchers’ findings point to the possibility that I might find Extraversion positively relates to PLC quality. Low levels of Neuroticism likely correlate with higher PLC quality scores as well as overall teacher effectiveness.

Research on teacher personality and quality are more prevalent in the university setting, though quality measures in those studies tend to be student evaluation data. One study that examined teacher personality and teacher effectiveness in the college setting found that of the five personality factors, only Agreeableness predicted instructional quality as measured by student surveys (Kneipp et al., 2010). However, this study was plagued by methodological issues in that the researchers had 63 professors complete the Big Five Personality Test, a measure of questionable reliability and asked the professors to release the previous two years’ of student evaluations. Measuring instructional quality by student satisfaction surveys alone raises a number of issues particularly because the researchers used all 10 domains of the student course evaluations, not just perceived instructional quality (Kneipp et al., 2010). Furthermore, student course and professor satisfaction might be related to factors like course and grading easiness rather than actual teaching quality.

A second study examining the relationship between professor personality and student evaluations was sounder and its conclusions more valid. Patrick (2011) surveyed 176 university students at the end of their course while the professor stepped out of the
room. She asked them to complete the Big Five Inventory personality assessment of themselves, their professor, and complete the final course evaluations. Patrick used the Big Five Inventory because it is shorter than the NEO PI-R but has good reliability and convergent validity with the NEO PI-R. She found that students’ expected grade in the course significantly predicted their overall rating of the course, but it explained only 4% of the variance in the overall ratings of the course. Students’ ratings of their professors’ personality was much more predictive of students’ rating of the course and instructor’s teaching ability (Patrick, 2011). Openness and Conscientiousness added significantly to the explanation of variance in instructor ratings (Patrick, 2011). Patrick (2011) was careful to point out that it was unclear whether students’ rated open, conscientious professors as better instructors because students are biased toward those personality traits or because those traits actually help professors teach better.

To better understand whether personality traits can truly predict teacher effectiveness, a valid, reliable teacher effectiveness measure is needed—particularly when teaching quality is a study’s outcome variable. Studies going back decades show that student evaluations of university professors’ effectiveness are correlated with teacher personality. However, the personality measures used in many of these studies are not valid, reliable measures. Some studies ask students to rate their professors’ personality while others have professors’ peers rate personality. Furthermore, the student evaluation measures also pose construct validity concerns—are student evaluations really measuring teacher effectiveness or are they measuring teacher likability? These studies point to the
need for research using valid, reliable personality measures and valid, reliable teacher
effectiveness measures.

Objective studies of elementary teachers are scarce. One study that did directly
examine teacher personality and effectiveness found that teacher effectiveness, as
measured by a short principal survey, could be predicted by certain personality traits
(Watts et al., 2011). The researchers used a longitudinal design, using Cattell’s 16PF to
assess student teachers’ personalities, and then after those student teachers had been
teaching three years, sent the teachers’ principals a short 5-point Likert scale teacher
effectiveness survey (Watts et al., 2011). Results showed that teachers high in
perfectionism, tension, privateness, and rule-consciousness were more likely to be rated
as better teachers by their principals. These results suggest that in my study, the NEO
FFI-3’s Conscientiousness and Neuroticism factors might predict teacher effectiveness.
Using the NEO FFI-3 and a reliable, detailed teacher observation instrument will extend
Watts et al.’s (2011) study.

Emmerich, Rock, and Trapani (2006) studied personality effects on practicing
teachers’ teaching specialty and teaching quality. Participants were teachers seeking
National Board of Professional Teaching Standards certification. The researchers found
two FFM subscales that correlated with teacher effectiveness: assertiveness (subscale of
Extraversion) and envy-jealousy (subscale of Neuroticism). The authors theorize that the
latter connection exists because jealousy can lead to social comparison and
competitiveness which could be a motivating factor for quality teaching.
Studies indicate that Conscientiousness is important not only for career success, but academic success (Chamorro-Premuzic & Furnham, 2003). In the current U.S. educational system where teachers are called on to be lifelong learners, identifying personality factors conducive to learning will also highlight teachers likely to succeed. For example, researchers using the *NEO PI* to longitudinally investigate the link between personality and student university achievement (measured by exam grades and supervised final-year project grades) found that low Neuroticism and high Conscientiousness significantly predicted academic achievement, with Conscientiousness being the most important correlate and predictor (Chamorro-Premuzic & Furnham, 2003). This, along with other personality research showing Conscientiousness’s relation to training performance, suggests this trait might relate to the current study’s PLC quality measure.

Extraversion and Conscientiousness are likely predictors of teacher effectiveness. Many teacher activities are labor-intensive, so a highly Conscientious teacher, who is more likely to be disciplined, achievement-striving, and deliberate in her planning, might have higher quality lessons with more opportunities for student engagement and higher-order thinking. Extraversion likely increases teacher effectiveness because they would have more positive affect and maybe more language modeling. Extraversion and Conscientiousness might also relate to teachers’ classroom management because a detail-oriented, assertive teacher is more likely to attend to students and require their adherence to expectations.

As mentioned above, scant useful research on the connection between teacher personality and teacher effectiveness exists, and what has been done needs to be
extended. Most of the research on personality and teaching has been descriptive, outlining what type of people are likely to enter the profession or are already teaching, not how their personalities relate to actual teaching quality outcomes (Harris & Rutledge, 2010). Many studies that do tie teacher personality to their performance focus on either student or novice teachers or university professors (Harris & Rutledge, 2010). Methodologically sound studies directly assessing the teacher personality-teacher effectiveness link are needed to add to the literature on how to recruit and retain quality teachers. This study builds on previous research to determine which personality traits of veteran teachers affect PLC quality and teacher effectiveness. The current study is the only one to my knowledge that will use the well-regarded NEO FFI-3 and objective classroom observations of early elementary school teachers to investigate the impact of teacher personality on teacher effectiveness.

**Professional Learning Communities**

A PLC is a community that promotes and sustains the professional learning of its members with the collective purpose of enhancing student learning (Vescio, Ross, & Adams, 2008). The current educational environment calls on teachers to meet in PLCs to assess student work, plan instruction, and reflect on teaching. Many school districts mandate teachers meet at least weekly to collaborate on instructional plans and techniques. Since the mid-1990s, when the term professional learning community began to be used, PLCs have rapidly spread to various school districts, but have been used in different ways (Hargreaves & Fullan, 2012). Some districts use PLCs as they were originally designed, as a way to foster teachers’ overall capacity for inquiry, instructional
improvement and change (Hargreaves & Dawe, 1990; Hargreaves & Fullan, 2012). Other districts use PLCs as a strategy to implement external reforms (Hargreaves & Dawe, 1990; Hargreaves & Fullan, 2012). For PLCs to fulfill their promise as a school improvement structure, they must be viewed and supported as teacher professional development structures, not as mechanisms to enforce external agendas that might not necessarily relate to teaching and learning improvement.

Teacher collaboration brings teachers together to assess student work, plan instruction, and reflect on teaching, and is often touted as an important mechanism for instructional improvement (DuFour, 2004; Shulman, 2004; Vescio et al., 2008). “It is claimed that school-based teacher collaboration stimulates greater improvements in teaching and learning, facilitates implementing effective change, and provides possibilities for new models of professional development based on shared reflection in the workplace” (Lavie, 2006, p. 774). The claims sound impressive, but the issue of whether collaboration necessarily leads to instructional improvement has not been put to rest.

Teacher collaboration is often touted as an important mechanism for instructional improvement, but the link between teachers working together and individual teacher effectiveness is precarious. An assumption behind requiring teachers to work in PLCs is that teacher collaboration acts as professional development and can therefore improve teachers’ instructional skills. Darling-Hammond (2013) writes that, “a major part of teachers’ ongoing professional learning takes place as they develop, in collaboration with their colleagues, the specific lessons and assessment tools they will use in the classroom”
Participating in PLCs thus becomes a medium through which teachers improve instructional strategies to increase student learning (Lavie, 2006). Despite the widespread use of PLCs, whether collaboration necessarily leads to instructional improvement is unclear: although research exists on teacher collaboration in general, there is not much empirical evidence on the impact teacher collaboration has on teacher effectiveness (Brownell et al., 1997; Damore & Murray, 2009; Goddard, Goddard, & Tschannen-Moran, 2007; Hindin, Morocco, Mott, Aguilar, 2007).

A major impediment to PLCs functioning as organizational learning mechanisms is improper implementation and support. Too often, PLCs' original purpose is displaced and they become yet another program to implement (Hargreaves & Fullan, 2012). Despite the clamor to set up PLCs in schools, educators and administrators must keep in mind that PLCs are not an end in themselves but a means to an end: improved teaching and learning.

Teachers no longer work in isolation, so their work should not be studied as if it takes place in a vacuum. In addition to a teacher’s personality factors, the school environment must be examined to understand important influences upon teaching quality. Teachers work in a highly social environment—researchers assert that teachers have thousands of psychological encounters in a normal school day (Glickman, Gordon, & Ross-Gordon, 2004). Research on teacher effectiveness must account for the influence of this highly social system, particularly in light of the fact that many school districts now mandate teachers meet regularly in PLCs to discuss teaching and learning. In the current American teaching environment where teachers are called upon to work closely with
other faculty to increase student learning, the quality of those interactions must be studied.

**Structure of U.S. schools**

Teaching has historically been a solitary endeavor (Hargreaves, 2004). As Lee Shulman (2004) writes, "teaching is the very prototype of the ideographic, individual, clinical enterprise" (p. 139). Andrew Hargreaves (2004) outlines four ages of teacher professionalism, the first three of which represent the nature of teachers’ work as isolated and the last of which reviews the profession’s progression to being more collegial: (1) the pre-professional age, (2) the age of the autonomous professional, (3) the age of the collegial professional, and (4) post-professional or postmodern. The first two ages span most of the last two centuries and characterize teaching as a private, individual endeavor where teamwork was usually impractical and also not desired by teachers.

A historical perspective helps to understand how teaching evolved to be an isolated profession. Although some northern states had public schools in the early 1800s, public elementary schools did not become a reality for all American children until 1900 (Pulliam & Van Patten, 2003). From the time public schooling began until the mid-20th century, U.S. teachers had relative isolation and autonomy (Cuban, 1984). Public schools established practices that were recognizable even a century later, with graded classrooms and a nine month school year. Most important in setting the stage for the isolated nature of teaching, each teacher had a classroom to herself (Cuban, 1984).

Rural schools were particularly isolated, and many American children attended such schools in the early years of the American public school system. In 1890, 77% of
America’s children attended rural schoolhouses, many of which were one-room schools where the teacher had not only a classroom to herself but a whole ungraded school that might hold a range of students from five-year-olds to young adults (Cuban, 1984). Partly to be able to handle large class sizes and partly in response to the Frederick Taylor’s scientific management movement, schools became one of the starkest examples of an entire institution modeled after the assembly line (Senge, 2012). Hargreaves (2004) describes teaching during this time as mostly teacher-centered and mechanistic, including strategies like recitation and lecturing, note-taking, question-and-answer, and seatwork (Cuban, 1984; Hargreaves, 2004). Metaphors for U.S. schooling include the school as a factory or machine, where the teacher is the supervisor of compliant children doing routinized work (Cuban, 1984; Senge, 2012). These formats enabled teachers working with large groups of children to meet four basic classroom demands: maintaining student attention, covering content, motivating students, and achieving at least some degree of mastery (Hargreaves, 2004). The private, isolated nature of teaching was therefore established early in U.S. history as a standard school structure.

The age of the autonomous professional began around the 1960s, when teaching became viewed as a profession (Hargreaves, 2004). Teacher university pre-service training and the growth of teacher in-service training gave credence to claims of teacher professionalism (Hargreaves, 2004). Despite the rise of teacher professionalism and pedagogical arguments raised by progressives, most classrooms in the 1960s and ‘70s looked as they had and actual progressive practice implementation—discovery learning and cooperative group work, for example—were modest (Cuban, 1984; Hargreaves,
During this time, many teachers enjoyed a measure of trust, material reward, job security, and professional discretion (Hargreaves, 2004). Teacher individualism and isolation persisted through this era, spanning most of the 20th century (Hargreaves, 2004). Although teachers enjoyed a measure of respect and autonomy during this time, most schools remained entrenched in the old mechanistic school structure (Senge, 2012).

By the 1990s, individual teacher autonomy was becoming unsustainable as a way to respond to an increasingly complex educational environment (Hargreaves, 2004). National attention turned to flaws in the US educational system with the 1983 publication of *A Nation at Risk*. By the mid-1980s, evidence surfaced that teacher collegiality could have positive outcomes and educators began calling for increased teacher collaboration (Hargreaves, 2004). Prominent educators touted the worthiness of building schools that “provide settings for teachers to both serve and learn with colleagues” (Cuban, 1984, p. 264). The paradox of this is that people raised in assembly line schools are the ones trying to restructure schools into learning organizations with different norms, rules, and thought patterns (Senge, 2012). This institutional intransigence remains one of the largest obstacles to overthrowing norms and routines of secluded individualism with new norms of cooperation and sustained collective learning.

Widespread agreement exists that collaborative teacher teamwork is necessary to meet the demands of a diversity of student needs and societal demands for teacher accountability. In this era of high student diversity and new technology, teaching is highly difficult and complex (Hargreaves, 2004). Teachers around the world are now faced with pedagogical demands to teach students skills like teamwork, higher order
thinking, and new information technologies that require teachers to employ new styles of teaching—styles they themselves were not taught with or about (Hargreaves, 2000). In the U.S.’s high-stakes educational environment, quick adaptation is needed. Teachers are encouraged to work with colleagues to collectively gain the expertise needed to meet these new teaching demands (Hargreaves, 2004).

Since the 1990s, PLCs have “spread like wildfire” (Hargreaves & Fullan, 2012). With the recognition that collaboration may increase teacher learning and effectiveness, schools are encouraged to promote teacher collaboration as a path towards school improvement (DuFour, 2004). The current high-stakes accountability environment places myriad demands upon teachers; it makes theoretical sense that more teachers tackling teaching and learning issues would be better than teachers tackling such problems in isolation. Indeed, Shulman (2004) argues that the only way for teachers to act critically, decisively, and self-correctively under current conditions is for teachers to work together. Educational theorists assert that teacher collegiality and collaboration are absolutely critical in ensuring excellent teaching in the face of current accountability reforms (Shulman, 2004).

**Benefits and Potential Pitfalls of PLCs**

PLCs are highly touted as a school improvement structure. PLCs became increasingly popular in the 1990s and their use as a school reform mechanism continues across the country (DuFour, 2004). Three main benefits ascribed to PLCs include: (1) better teacher motivation and efficacy; (2) teacher learning and development; and (3) increased student learning (York-Barr & Duke, 2004). For schools to improve,
instructional leadership must come not only from principals but also from teachers.

Meeting in PLCs is perhaps the most efficient way for teachers to learn from each other and develop their craft (York-Barr & Duke, 2004).

When teachers are mandated to meet in PLCs as a school improvement initiative, PLCs are essentially network interventions. Network interventions are the purposeful use of a social network to accelerate behavior change and improve organizational performance and goal achievement (Valente, 2012). Widespread acceptance exists that organizational change is ideally implemented by group members undergoing the change (Valente, 2012). When a social group is called upon to implement a network intervention, positive social group dynamics are critical to group and institutional success. When the group is fragmented, not centralized, or dysfunctional, interventions will most likely be unsuccessful (Valente, 2012). Viewed from this lens, it is easy to see the theoretical basis for using PLCs as a school improvement tool. Educators need more clarity about the essential PLC attributes that ensure productive—rather than dysfunctional—teacher collaboration.

Teacher collaboration is an important mechanism for ongoing teacher learning and development (Clarke & Erickson, 2004). Through regular interactions and discussions with colleagues, PLCs hold great potential to help teachers to develop their instructional skills (Hargreaves & Dawe, 1990). Many educators argue that the most effective professional development is embedded in schools and driven by teacher research, leadership, and collective learning (Cochran-Smith & Lytle, 1999). Teachers have much first-hand experience with teaching and learning that makes them important
resources for their peers (York-Barr & Duke, 2004). Cochran-Smith and Lytle (1999) assert that although important knowledge about teaching can certainly be gained from university-based researchers, effective teacher collaboration creates important teacher learning. Knowledge of effective teaching arises from systematic collective inquiry about instruction, student learning, and curriculum (Cochran-Smith & Lytle). Becoming a master teacher takes years of reflective practice and active engagement in professional education opportunities, including relying on peers for direction, reflection, and information (Nadelson et al., 2012). Teachers’ own PLCs are thought to be the best structure for teacher learning (Hargreaves, 2004).

In a collegium, individuals come together with a shared mission (Shulman, 2004). Shulman asserts that the collegium is indispensable as an educational reform tool because it allows individuals to overcome bounded rationality and in the process, learn from experience. Although collaboration is ideal, schools have few enabling structures, such as scheduling or team teaching arrangements, that make teacher collaboration easier (Shulman, 2004). Teacher collegiality and collaboration is widely accepted as facilitating high-quality teaching, but schools vary widely in how they support teacher collaboration. Certain school structures can be put in place to increase collegiality. Mentor teacher programs foster collegiality between novice and experienced teachers. Another structure that can foster collegiality is weekly or biweekly teacher meetings akin to the teaching hospital's weekly rounds where interesting or problematic cases are presented and discussed (Shulman, 2004).
Teachers engaged in PLCs exhibit specific actions (DuFour, 2004). DuFour (2004) details a number of behaviors teacher engage in as part of PLC work. They plan instruction and assessments together, agreeing on standards of proficiency that will be used to measure student progress. At the end of units, they analyze how all students in the grade-level performed, identifying strengths and weaknesses so that teachers can build on student strengths and address student weaknesses. The PLC team discusses what aspects of instruction are working and which are not working to improve their teaching strategies to raise student achievement. Teachers collaborate on goals, strategies, materials, pacing, questions, concerns, and results (DuFour, 2004).

A lack of knowledge about how to properly implement PLCs can impede group performance. Traditionally, teacher norms have not supported teacher instructional leadership and strong collaboration around curriculum and instruction. Teachers have been socialized to be private, to follow school authority and not to assume leadership responsibilities (York-Barr & Duke, 2004). Teachers who step up to leadership roles were usually seen by their peers as stepping out of line (York-Barr & Duke, 2004). Teachers have not been trained to help their peers grow professionally and many teachers can find this role uncomfortable at first (Hoerr, 1996). Teachers are used to seeking help for superficial issues such as sharing materials (worksheets, paint, paper, etc.). Increasingly, school districts now require teachers to go beyond this perfunctory cooperation and instead engage in deep instructional discussions centered on lesson planning and analysis, student work and assessment data review, and identification and continued monitoring of instructional interventions for struggling students.
Group work holds great potential benefits but it can waste group members’ time and energy and force norms of low rather than high expectations. Patterns of destructive conflict can arise within groups (Felps et al., 2006; Hackman, 1987). Low-quality groups that engage in poor decision-making and conflict can decrease rather than increase employee efficiency, leading to low productivity (Campion, Medsker, & Higgs, 1993). Similarly, teachers’ PLC quality is most likely more important to their instructional effectiveness than is PLC existence alone. Therefore, PLC functionality must be examined when PLCs are called upon to be change agents for school improvement. Research is still needed to determine circumstances that affect network intervention success (Valente, 2012). Because network interventions are based on accelerating social influence, a thorough understanding of the social mechanisms affecting the desired behavior change is required (Valente, 2012).

Given PLCs’ potential for improving teaching, care should be taken that they are not another educational fad. Too often, education officials adopt an educational concept, package it, and disseminate it throughout the country with little consideration for local school culture. Acknowledging America’s great diversity should come with understanding that the PLC structure that works in one school cannot and should not be transferred exactly to another school. American schools have a history of taking concepts successful in one place, disregarding the contextual factors that influence successful implementation, and thereby failing to effectively transfer the concept. Open schools are an example of this. British schools had success with open classrooms and American fervor over the concept peaked from 1967 through 1973, but because essential attributes
that made the concept successful in British schools were not fully understood, the concept quickly lost favor and became another passing educational fad (Cuban, 1984). Although the merits of open schooling are dubious, like many other educational ideas that teachers have had to endure, open schooling represents an initial failed attempt at breaking down not only psychological but physical barriers to collaboration. DuFour (2004) writes that the term is so ubiquitous that it is in danger of losing all meaning and that the PLC model will only weather the test of time if educators commit to reexamining the core principles of what makes PLCs work. Research and theory show that if implemented with sensitivity to schools’ and groups’ sociocultural context, PLCs hold great promise as an organizational learning structure that can increase teacher effectiveness.

**PLCs and Teacher Effectiveness**

One of the strongest determinants of improved student achievement is improved instruction, but instructional practices are notoriously resistant to change (Taylor, 2008). One of the main purposes in implementing PLCs is their use as a teacher learning tool (Supovitz, 2002). Peers are a main source of instructional influence on teachers, so structuring schools to increase teacher interaction is a sensible way to increase teacher instructional discourse and improve school performance (Cuban, 1984; Stoelinga & Mangin, 2008). However, how schools adopt PLCs matters greatly in their effects on teacher instruction and student learning (Supovitz, 2002).

Particularly in the current high-stakes standardized testing environment where teachers report feeling constrained in lesson planning and instruction (Mathison & Freeman, 2003), PLCs are an important way teachers can work together to help ensure
high quality instruction. A dearth of empirical evidence exists to support the establishment of PLCs as a way to increase student achievement (Lavie, 2006; Nadelson et al., 2012).

Previous studies show that when teachers work in PLCs, they experience increased positive attitudes and beliefs, but the relation to instruction is not as clear (Leithwood & Mascall, 2008; Supovitz, 2002; York-Barr & Duke, 2004). Teacher collaboration can increase efficacy, trust, empowerment, and job satisfaction (Goddard et al., 2007; Vescio et al., 2008). Studies associate collaboration with feelings of relatedness and peer support (Brownell, Yeager, Rennells, & Riley, 1997). Supovitz (2002), in a study comparing teacher beliefs and practices in PLC versus non-PLC schools, found that teachers in the PLC schools felt more involved in school decision-making and reported higher levels of interaction and collaboration than teachers in non-PLC schools. Much research now supports the positive culture and climate that can result from teachers working together, but whether this translates to instructional change and student achievement is still unclear, though some evidence supports a positive relationship (Brownell et al., 1997; Damore & Murray, 2009; Goddard et al., 2007; Leithwood & Mascall, 2008). Empirical research tying PLCs to teacher classroom behaviors and student learning are still relatively rare (Goddard et al., 2007; Vescio et al., 2008).

Some studies support that PLCs influence teacher instructional change and student achievement. Supovitz, Sirinides, and May (2010) found that teacher reports of instructional peer influence predicted teachers’ reported instructional changes in language arts and mathematics. The reported instructional changes related to gains in students’
state achievement test scores in language arts, but not mathematics (Supovitz et al.).

Vescio et al. (2008) conducted a literature review of eight studies that attempted to clarify the relation between PLCs and student achievement. In all eight studies, researchers found that student learning improved when teachers participated in PLCs. Most studies found student achievement gains in both math and language arts for elementary and secondary students. Many of the studies emphasized the importance of PLCs’ data-driven dialogue and focus on instructional strategies (Vescio et al.). Unfortunately, not all eight studies were peer-reviewed, and although Vescio et al.’s review supports the benefits that PLC advocates promise, more research is needed.

Other studies that found positive relations between PLCs and student achievement contribute to the literature but suffer from methodological issues that limit generalizability. One study, by Goddard, Goddard, and Tschannen-Moran (2007), sought to fill this void by empirically studying the link between teacher collaboration and student achievement, but limitations abounded and its results are not the silver bullet connecting PLCs and student achievement. In Goddard et al.’s (2007) study, 47 elementary schools with 452 teachers and 2536 fourth grade students participated. Teachers completed surveys on teacher collaboration. The outcome measure was fourth-grade students' scaled scores on state-mandated mathematics and reading assessments. The researchers controlled for students' gender, race/ethnicity, SES, and prior student achievement (Goddard et al., 2007). Goddard et al. found that teacher collaboration was a statistically significant predictor of variability in schools' mathematics and reading scores (Goddard et al.). However, the study included significant weaknesses. First, the
researchers administered the teacher collaboration survey along with another survey for a separate study to each school's faculty during a monthly faculty meeting. Teacher surveys were anonymous so the researchers did not track what grade-level the teachers taught (Goddard et al.). This is a weakness because fourth-grade students were studied and ideally, the students’ own fourth-grade teachers' perception of teacher collaboration would be the independent variable in the study. Second, teacher collaboration was measured using a general, six-question survey, raising questions about whether such a short survey can validly and reliably capture teacher collaboration. Third, the researchers used hierarchical linear modeling because they viewed the students’ data as nested in each school, but their model did not nest the students into teachers’ classrooms because the researchers did not collect that data. Fourth, the assessment that the researchers used to control prior student achievement (Metropolitan Achievement Test) was not the same as the one they used to measure student achievement in the year they conducted research (the state-mandated tests). Lastly, the school district contained a highly transient population and the researchers had to deal with 14% of the students’ having missing data (Goddard et al.).

Leithwood and Mascall (2008) examined whether PLCs related to student achievement. They hypothesized that if PLCs had more power within a school—exercised more control over their planning and decision-making—student achievement would be higher. The researchers found that PLCs were the only school variable (others were administrators, individual teachers, district administrators, and students) that emerged as having positive statistically significant relations to student achievement. The
highest achieving schools in their sample had higher levels of PLC empowerment. The highest achieving schools were also the schools with the highest SES, which raises the issue of whether more effective teachers are teaching in the high-SES, high achieving schools, as researchers have asserted is the case (Darling Hammond & Sykes, 2003; Hanushek & Rivkin, 2007).

Supovitz (2002) conducted an in-depth longitudinal study to determine the relation between teacher PLC participation, PLC quality and resulting student achievement. His study had an experimental group that consisted of 41 PLC schools and a control group of 38 non-PLC schools. (Supovitz uses the term team-based schools rather than PLC schools which I use here for consistency.) Supovitz examined teachers’ group instructional practices and measured the frequency teachers worked together on instructionally related issues such as: (1) using test data, student work, or both to plan instruction; (2) using rubrics to assess student assignments; and (3) examining how well curriculum and assignments aligned with district standards. Teachers who worked in schools that implemented PLCs did indeed report higher levels of collaboration. However, the increased school culture characteristics did not necessarily translate into changed instruction, particularly for elementary schools, for which no statistically significant difference was found in group instructional practice depending on school PLC participation. There were statistically significant differences for middle and high school teachers between PLC and non-PLC school on group instructional practices. One possibility for the lack of difference for elementary school is that teachers in non-PLC elementary schools still recorded fairly high rate of peer collaboration and interaction.
whereas middle and high school teachers in non-PLC schools did not. Supovitz found a clear pattern of a relation between the degree of teachers’ group instructional practice and student achievement. In 14 of 25 tests, there was a statistically significant positive relationship between teachers’ group instructional practices and student achievement. In only one case, seventh grade mathematics, was there a statistically significant negative relationship. For writing, there was a statistically significant positive relationship for all grades except grade 8. Supovitz concludes that meeting in PLCs alone is insufficient to influence student achievement. Instead, PLCs must focus on group instructional practices to raise student achievement. My PLC quality survey seeks to incorporate Supovitz’s findings by including a learning orientation subscale which measures the degree to which PLCs focus on instructional practices similar to the ones laid out by Supovitz as being important in affecting student achievement.

To complicate matters, other researchers have found negative impacts of PLCs on student learning (Leithwood & Mascall, 2008; Leithwood, Patten, & Jantzi, 2010). Such researchers cite the need for school leaders to be guided more by research-based leadership decisions rather than instituting structures that might be popular but not research supported. For example, Leithwood and colleagues (2010) write that "PLCs are clearly the dominant innovation in schools across North America, with the considerable challenges they present to implement well often glossed over" (p. 694). Although often overlooked, attending to PLC quality is necessary if we are to rely on PLCs as a mechanism for student achievement and school improvement.
It is easy to see that for teachers to be able to focus on instruction to such a deep degree and learn together about how to improve student learning, certain factors must be in place for them to be productive and functional. PLCs hold great potential as a teacher and student learning tool, but much better understanding is needed about how to support teachers in this endeavor. To be successful, educational reform efforts must be thoughtful, systematic, and comprehensive (Cuban, 1984).

**Essential Attributes of High-Quality PLCs**

Healthy PLCs have a group identity, interactional norms, and a shared sense of responsibility to each other (Borko, 2004). Borko writes that ideally, teachers in PLCs trust and respect each other and have communication norms that enable critical dialogue around teaching analysis. The PLC quality survey developed for this study incorporating these aspects of healthy PLCs—teaching identification and connection to their PLC, productive conversation, a shared commitment to ongoing learning, and group insularity (as supported by the principal). Identifying and measuring factors that contribute to a healthy PLC is an important step in helping schools foster functional teacher collaboration. I hypothesize that the relationship between PLCs and teacher effectiveness is mediated by PLC quality; i.e., teachers will be more effective in meeting all their students’ needs if they have a highly collegial PLC on which they rely, but if they are mandated to meet with an ineffective PLC, their effectiveness can suffer.

Research from social psychology and organizational psychology helps identify essential attributes of highly functional teams. Hackman (1987) proposed that a comprehensive assessment of ongoing work group success must capture both current
group effectiveness in terms of their present performance and future group effectiveness, i.e., their capability to continue working together. The current study’s PLC quality survey is comprised of four measures of group process. Current group effectiveness is captured by all four subscales but particularly the collegiality and learning orientation subscale. Future group effectiveness is represented by the subscale of group cohesion and principal support, as this construct is important for group longevity. I hypothesize that group cohesion, collegiality, principal support, and instructional press are integral PLC components necessary for optimal PLC function that will increase teacher effectiveness.

**Cohesion.** Group cohesion refers to the degree to which members feel they are part of the group. Group cohesion captures member interdependence and research shows positively relates to group outcomes (Barrick et al., 1998; Hackman, 1987; Morgeson et al., 2005). In his seminal work on the design of work groups, Hackman (1987) proposes that group cohesion can explain group performance differences because members of cohesive groups talk more about their work and encourage each other to work hard and efficiently. Cohesive social groups may act as a buffering mechanism against negative outside influences (Fiorillo & Sabatini, 2011). The affective support members provide each other can balance stress and anxiety provoked by outside demands (Fiorillo & Sabatini, 2011; Fullan & Hargreaves, 1996).

Social network research provides information as to what contributes to groups staying together and points to the importance of group cohesion (Palla, Barabasi, & Vicsek, 2007). To investigate contributing factors to network stability, Palla, Barabasi, and Vicsek (2007) studied two kinds of social networks: collaboration between scientists...
(measured by co-authorship of published research articles) and phone calls between mobile phone users. The researchers developed an algorithm to investigate the connection of identified social groups, studying 30,000 authors and mobile phone call records between over 4 million users spanning 52 weeks. The researchers focused on how group size affected group longevity. Results of this social network study that apply to the study of PLCs is that Palla et al. found that for small communities, comprising just a few members, the relative commitment of a member to people within the group must be greater than that member's commitment to those outside the group or the member is more likely to leave the community. The authors conclude that tracking an individual's commitment to other members of their group provides an important clue predicting a group’s fate (Palla et al.).

Cohesive groups have reciprocity between members (Tao & Winship, 2001). Cohesion is a relational component of social solidarity, where people are bonded nonexclusively in ways that form a basis for positive relations that hold a group together (White & Harary, 2001). Social relationships are one of the strongest predictors of network patterns (Supovitz, 2008). Teachers are more likely to discuss professional issues with friends rather than others with whom they have less strong ties. In a study on instructional influences, Supovitz (2008) found that nearly 15% of interviewed teachers mentioned social explanations as a reason for identifying someone as a source of instructional influence.

Social cohesion results from relational closeness and bonding and is an important prerequisite for teachers’ collective instructional improvement. Hargreaves and Fullan

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(2001) write that teachers should not be thrown into meetings where they are to discuss students’ work and disturbing data together unless a platform of secure relationships has been built. This directly ties to my hypothesis that a PLC’s cohesion is a critical component of quality group interactions—if teachers do not feel like a valued member of an interdependent group, they are less likely to be able to openly collaborate on difficult issues of teaching and learning.

**Collegiality.** Merriam-Webster (2013) online defines collegiality as “the cooperative relationship of colleagues.” Open communication is a critical cooperative component to group effectiveness (Bushe, 2006; Fullan & Hargreaves, 1996; Hackman, 1987). For example, if a group avoids anxiety-arousing work discussions or handles conflict dysfunctionally, they might also be avoiding difficult problems that need solutions for the group to be effective (Bushe, 2006). Crucially, groups must be able to handle differing opinions, identify and build on members’ strengths, and collaborate to improve their weaknesses (Hackman, 1987). A group’s propensity to seek out differing opinions and collaborate on solutions is critical to its success (Hackman, 1987). This study’s PLC quality measure therefore includes measures of teacher cooperation and ability to foster open communication and elicit differing perspectives without devolving into maladaptive conflict.

Collegial PLCs engage in behaviors consistent with recognition of members’ interdependence in order to achieve improved instruction. Authenticity and openness are crucial to effective working relationships (Bushe, 2006). In collegial PLCs, rather than keeping failures and uncertainties hidden, members share and discuss their problems with
the view that openness and collaboration lead to instructional improvement (Fullan & Hargreaves, 1996).

The current study draws from organizational psychology, social psychology, and education research literature to operationalize collegiality to include group member cooperation, open communication, and work load sharing as part of collegiality. These are aspects of work groups that research has found essential component of group processes that set the conditions for high group performance (Morgeson et al., 2005).

**Learning orientation.** PLCs’ learning orientation refers to the degree to which they engage in collective inquiry that results in new knowledge and alters their instructional practices (Bushe, 2006; Nadelson et al., 2012; Wenger & Snyder, 2000). In PLC meetings, teachers participate in reflective dialogue about curriculum and instruction by examining data and using evidence about successful practice (Nadelson et al., 2012). For PLCs to improve teacher effectiveness, teachers’ interactions should focus on instruction (Roberts & Neal, 2004; Supovitz, 2002). Historically, when teachers did interact it was around materials, discipline, and individual student problems rather than curriculum goals and pedagogy (Hargreaves, 2004). I hypothesize that the higher a PLC’s learning orientation, the more effective its teachers will be.

PLCs are particularly well-suited to increasing teacher instructional dialogues because a PLC is typically comprised of a teacher’s peers, and teachers may feel more comfortable sharing instructional challenges with peers rather than formal school leaders or others with whom they do not have frequent contact (Supovitz, 2008). Indeed, in a study Supovitz (2008) conducted to study instructional influence, he found that physical
proximity and social connections were important contributors to whether teachers identified one network over another as having instructional influence.

Although the reasoning underlying the requirement for teachers to meet weekly in PLCs is that teachers will then discuss their teaching and learning experiences, the reality is that too often, meetings become times when teachers discuss logistics like pacing or how to meet administration demands, with little focus on instructional improvement. Surely, PLCs that discuss instruction rather than merely logistical concerns will produce better teaching. This study investigates this link between PLC meeting focus on instruction and resulting teacher effectiveness to test the hypothesis that if teachers are part of PLCs with high instructional press, they are more likely to be highly effective for teachers.

Principal support. School principals significantly influence school climate and are often the main catalyst for teachers working together. Principals’ organizational decisions that structure the teacher workday (like requiring certain meetings at certain times) and how principals affect teachers’ emotions are particularly impactful.

In a study that highlights the importance of leadership to school quality, Leithwood, Patten, and Jantzi (2010) examined four aspects of principal leadership to examine how each affected student learning. The quantitative study is part of a larger five-year project in a Canadian province aimed at improving elementary students’ language and math achievement by improving school leadership quality. Participants in the study were 1445 teachers of the province’s 72 school districts. Online teacher surveys were used to collect evidence about the variables (Leithwood et al., 2010). One aspect
they studied was “emotions,” represented by the two variables of collective teacher efficacy and trust in colleagues, students, and parents (Leithwood et al.). A second aspect they measured was “organizational attributes” represented by the two variables of instructional time (to what degree teachers could maximize instructional time) and professional learning community (Leithwood et al.). The researchers found that the emotions variables accounted for 21% of the total explained variation in student achievement. This relates to my PLC quality’s cohesion and collegiality subscale, which captures the PLC members’ relationship quality. Interestingly, the organizational variables—instructional time and “PLCs”—had weak negative effects on achievement (-.8%). However, the description of how the researchers operationalized and measured PLCs is unclear. Leithwood et al. (2010) write that a 9-item scale “was developed specifically for this study, including for example, “I almost always learn something useful during PLC meetings” (p. 685). Whether this nine item scale captures important aspects of PLCs is questionable, as not enough information was provided in the article. The researchers found, though, that school leaders were able to influence organizational variables much more than the emotions variable (Leithwood et al.). This last point hints that school leaders potentially have significant influence over proper PLC implementation, making principals’ support of PLCs an important factor to measure.

Adequate school structure and resources are necessary to implementing and maintaining PLCs, underscoring the principal’s role in supporting PLCs. Sufficient time must be set aside for collegiality (Hoerr, 1996). Administrators are often central in structuring school so teachers have adequate time to complete their usual demands while
also meeting in teams. Teachers need sufficiently frequent and lengthy meeting periods to enable deep pedagogical discussions (Hoerr, 1996). Indeed, researchers have found that social interaction quality is likely more important than quantity (Fiorillo & Sabatini, 2011). Additionally, for teacher leadership to flourish, principals must at least encourage it and ideally, actively support it (York-Barr & Duke, 2004). In their study interviewing six Florida teachers of the year, Acker-Hocevar and Touchton (1999) found that principals were vital in either enabling or subverting teacher leadership and participation. Administrators who did not empower or value teachers created school environments where teachers felt safer staying in their rooms and not taking risks. As Acker-Hocevar and Touchton write, “where teachers make a difference, they are involved and actively committed. Where there is little or no impact, there is silence and withdrawal” (p. 10).

Additionally, research supports that principal support of PLCs is imperative (Fullan & Hargreaves, 1996; Holme & Rangel, 2012). As Fullan and Hargreaves (1996) write, “the development of collaborative schools, where they do exist has depended heavily on the actions of the principals in those schools” (p. 51). In support of this assertion, Holme and Rangel (2012) found support for the importance of leadership to PLC success. The researchers studied low-income schools in Texas to determine what school factors hindered or enabled school improvement. One of the five schools studied performed remarkably well respective to the other schools with more resources. A main reason the school performed well was the school administration’s establishment and support of PLCs. The principal obtained grants to fund PLC professional development and allocated a teacher planning period to allow for PLC meetings. In addition to
providing training and structural support for teachers to meet in PLCs, the principal regularly attended meetings to ensure that the meetings focused on planning, data analysis, and ongoing teacher learning in the form of book studies (Holme & Rangel, 2012).

In addition to supporting teachers with resources, principals should protect teachers from undue stress and distraction. Administrators must use their power to buffer teachers from demands that are not closely related to improving teaching and learning (Hoy & Sweetland, 2001). Principals support teachers by having enabling procedures and leadership styles that facilitate rather than hinder teacher growth and development (Hoy & Sweetland, 2001).

Lawrence Schulman (2010) bases his book, *Interactional Supervision*, on five core assumptions, three of which have direct application to school leadership as I frame it. Schulman's first assumption is that supervision is a bidirectional process in which the supervisor and employee are constantly influencing and being influenced by each other's behavior and expressed emotions. Schulman writes that one of the supervisor's focal roles in the organization is to help employees fulfill their roles. This viewpoint is reflected in the principal support dimension of my PLC quality survey—the boundary protection that principals should engage in so that teachers can maximize time set aside for collaboration. A second Schulman assumption that applies to my PLC quality conceptualization is that the supervisor-employee relationship parallels other helping relationships and that leaders must utilize skills in the domain of communication, relationships, problem solving and group facilitation. Undoubtedly, the principal is
responsible for the schools’ PLCs’ productivity. Too often, principals think that mandating the meeting requirement and requiring PLC meeting notes ensures PLC quality. Instead, I hold that principals play a crucial role in buffering PLCs from undue pressure and monitoring group collegiality and learning. A third Schulman assumption that influences my survey development is that the supervisor-employee relationship is an important medium for influencing employees' outcomes. The supervisor-employee relationship is defined as encompassing the three relational elements of rapport, trust, and caring. Considering principals as facilitators of teacher effectiveness fits with the social systems framework I adopt.

Educators need better understanding about whether meeting in PLCs by itself improves teaching or whether PLC quality matters more than quantity. Most likely, the quality of faculty’s interactions during grade-level or curriculum meetings influences teachers’ effectiveness. Too often, however, administrators place PLC meeting requirements on teachers with little follow-through in considering the quality of the meetings. If PLCs are to produce impressive outcomes, the participating teachers’ collective efficacy must be considered. Theoretically, if teachers feel collective efficacy about their PLCs, they are more likely to meet their group goals (Bandura, 1998). In the current American teaching environment where teachers are called upon to work closely with other faculty to increase student learning, the quality of those faculty interactions matters. If teachers meet in their PLCs to merely fulfill an external requirement without any belief in the group’s collective efficacy to improve student learning, precious teacher time has probably been lost and goals might not be achieved. Further research on
interactional attributes that affect social groups is necessary. As Valente (2010) writes, “by understanding how social networks can be used to improve learning, performance, and organizational outcomes, we can use the power of human interaction to improve the human condition” (p. 53). This paper explores whether PLC quality might matter just as much or more than other predictors of teacher effectiveness.

The Current Study

Although the U.S. certainly has many highly effective teachers, some districts, particularly in urban, high-poverty areas, have insufficient numbers of highly effective teachers. Current hiring practices do not ensure the candidate most likely to be effective is hired (Boyd et al., 2007; Hanushek & Rivkin, 2007). How teaching effectiveness is measured and predicted is a matter of heated debate, but most educators would agree that better predictors of teacher effectiveness are needed for school improvement efforts to be successful (Bill and Melinda Gates Foundation, 2013; Hanushek & Rivkin, 2007; Harris, 2011). Because data on traditional variables associated with quality teaching—experience and education—are inconsistently associated with valued outcomes, other possible predictors of teacher effectiveness must be explored (Darling-Hammond, 2013).

Antiquated selection and salary systems based on teacher experience and education are inadequate in identifying which candidates are likely to be effective teachers (Ballou & Podgursky, 2002). Multiple possible solutions to school improvement exist, but two options are particularly applicable to the current study: (1) identifying characteristics that predict PJ and PG fit will improve selection practices to ensure only candidates likely to be highly effective teachers are hired and (2) implementing PLCs
optimally so that they can function as self-maintaining, timely teacher development mechanisms to ensure teacher learning and improvement does not stagnate after the first few years in the profession.

To extend research on teacher effectiveness, the current study examines both traditionally researched variables (teachers’ educational attainment, years teaching) and less-researched variables of personality and PLC quality. This study extends PLC research by using a new PLC quality measure and the CLASS—an objective, reliable teacher effectiveness measure. The teacher observation measure is objective because of its design: raters must undergo training and certification, learning to suppress their biases along the way to increase rater objectivity and thus interrater reliability. This study will extend research on reliable, valid predictors of teacher effectiveness. The prospective significance of this study lies in its potential to inform teacher selection and assignment. Selecting teachers well-suited to teaching who are more likely to be effective will increase teacher retention and school quality. Assigning teachers already in schools to grade-levels where the members are likely to function as a high-quality PLC is another way to improve school quality.

To address these educational issues, the current study examines the following research questions, presented here with accompanying hypotheses to better frame the study:

1. How much variance in teacher effectiveness is accounted for by the PLCs the teachers are in?
2. Do teacher background characteristics (education, experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and PLC quality (collegiality, cohesion, learning orientation) predict teacher effectiveness (CLASS emotional support (ES), classroom organization (CO), and instructional support (IS) domains)?
   a) For teacher background characteristics, I hypothesize that teacher education and years of experience will not be related to teacher effectiveness.
   b) Of the five personality factors, I hypothesize that Openness to Experience, Conscientiousness, Extraversion, and Neuroticism will correlate with teacher effectiveness but Agreeableness will not. I hypothesize that Extraversion, Openness to Experience, and Conscientiousness will predict teacher effectiveness.
   c) For PLC quality, I hypothesize that higher levels of all four scales of PLC quality will predict more teacher effectiveness.

3. Does PLC personality composition (both individually and as a group) predict PLC quality and teacher effectiveness (CLASS domains)?
   a) I hypothesize that PLCs that have higher average levels of Openness to Experience, Conscientiousness, Extraversion, Agreeableness and lower Neuroticism will have higher PLC quality.
b) Low Agreeableness and Extraversion and high Neuroticism scores will relate to teacher effectiveness.

c) Higher levels of Conscientiousness and lower levels of Neuroticism will predict PLC effectiveness.

4. What do highly effective teachers believe constitutes: 1) effective teaching (particularly emotionally supportive teaching) and 2) high-quality PLCs?
3. METHODOLOGY

Teacher experience and education are not useful predictors of teacher effectiveness; they should not be used as substitutes for teacher effectiveness measures (Heck & Hallinger, 2009; Wayne & Youngs, 2003). Given the lack of strong, consistent evidence that degrees and experience predict teacher effectiveness, studies must move forward to find consistent, reliable predictors of teacher effectiveness.

Personality measures have been used to predict job performance in a number of occupational fields and their utility in predicting teacher effectiveness should be explored further. Personality has also been shown to impact group performance (Barrick et al., 1998). The current study’s focal social system—the PLC—is a work group that is purported to influence teacher effectiveness positively. Previous research supports that individual and mean group personality relates to outcomes, warranting examination of both in the current study.

A general lack of quality continuous professional development fails to support ongoing teacher learning. One educational initiative meant to increase teacher effectiveness is the PLC (Clarke & Erickson, 2004; DuFour, 2004; York-Barr & Duke, 2004). This educational reform initiative, in which many districts require teachers to work in groups, is meant to be a school improvement mechanism, but empirical evidence on PLCs’ relation to teacher effectiveness is needed (Brownell et al., 1997; Damore &
Murray, 2009; Goddard, Goddard, & Tschannen-Moran, 2007; Hindin, Morocco, Mott, & Aguilar, 2007; Lavie, 2006; Supovitz et al., 2010). This study is based on the assumption that PLC implementation alone is inadequate if attention to the quality of that implementation is ignored.

To address these educational issues, the current study examines personality factors and PLC quality to ascertain whether these variables are valuable in predicting teacher effectiveness. The study’s results could inform not only teacher hiring and assignment but also best practices in facilitating PLCs.

**Study Design**

This study used survey instruments, teacher observations, and interviews to address the research questions posed. Studying diverse contexts necessitates, or at least encourages, mixed methods. Therefore, interviews were added to the study to explore connections found via quantitative methods. This study examined not only what teachers do but also what they perceive and believe about their PLC’s quality. Employing observations, surveys, and interviews helps to triangulate the data to paint a fuller picture of the processes underlying the interaction of teacher personality, PLC quality, and teachers’ classroom performance. Each school, indeed each PLC, has its own unique culture, with considerable diversity across the United States. For researchers to be able to eventually generalize about PLC structures that facilitate effective teaching, rich, textured data is necessary. Empirical studies of how to support teachers in working together will increase school quality.
A small qualitative portion was added to the study to gain a better insight into the relations identified via quantitative data analysis. Creswell (2008) describes the explanatory mixed methods design as consisting of quantitative data collection followed by a small qualitative component that helps explain or elaborate the quantitative results. (Please refer to Table 3 for a matrix of the study’s methods.)

**Participants**

Participants included 57 Kindergarten through grade 3 teachers from two suburban public school districts in southern California. Each of these teachers works in one of 30 school-defined PLCs. Of the total 57 teachers, 55 completed the surveys and I was able to observe 54. A final sample of 52 teachers had data on all measures. However, a review of the data showed one significant outlier for the Conscientiousness factor. She was more than three standard deviations below the mean. Based on the extremeness of the deviation, along with the fact that while chatting with her after the observation she mentioned how disorganized and messy her classroom was (when in fact it was impressively neat and orderly), she was removed from further analysis, resulting in a sample size of 53 for the Conscientiousness factor. Table 2 presents participants’ demographics characteristics. Totals for race/ethnicity are greater than 57 because a number of teachers selected two or more categories.

<table>
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<tr>
<td>First</td>
<td>14</td>
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<tr>
<td>Second</td>
<td>12</td>
<td>21.05</td>
<td></td>
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<tr>
<td>Third</td>
<td>13</td>
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<td>Count</td>
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<td>25-34</td>
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<td>55-64</td>
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<th>Years teaching</th>
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<td>0-5 years</td>
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<td>8.77</td>
</tr>
<tr>
<td>6-10 years</td>
<td>3</td>
<td>5.26</td>
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<tr>
<td>11-15 years</td>
<td>12</td>
<td>21.05</td>
</tr>
<tr>
<td>16-20 years</td>
<td>10</td>
<td>17.54</td>
</tr>
<tr>
<td>21-25 years</td>
<td>11</td>
<td>19.30</td>
</tr>
<tr>
<td>Over 25 years</td>
<td>14</td>
<td>24.56</td>
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</table>

Note. n = 57.

The vast majority of study participants were white (88%) and female (93%). Most participants were experienced teachers (90% had over five years’ experience), with only five teachers holding less than a full credential that required more years of teaching. Most teachers held a bachelor’s degree (56%).

Context

The study took place in two medium-sized urban school districts in southern California. Both districts require teachers to meet in PLCs once or twice monthly. The districts are of similar size and serve similar populations. In one district, Presidio Unified
School District (PUSD), in which approval was received earlier, all elementary school principals in the district were contacted and half agreed to let me recruit teachers at their school. In the second district, Sierra Unified School District (SUSD), seven principals were identified by the district central office for possible participation. These seven principals were contacted and two agreed to my recruiting teachers at their schools. (Both district names are pseudonyms.)

**Instruments**

**Demographic survey.** To gather teacher background information, including years teaching, education level, number of years involved in a PLC, gender, age, etc., a demographic survey was used (please see Appendix C). It was modified from the U.S. Department of Education’s Schools and Staffing Survey (SASS). Although this background information on teachers was analyzed because previous literature often does so, the current study’s focus is on the effects of personality and PLC quality on teacher effectiveness.

**NEO Five-Factor Inventory-3 (NEO FFI-3).** The NEO FFI-3 (McCrae & Costa, 2010) is a commercialized 60-item personality measure of the Five Factor Model (FFM) of personality. This shortened version of the NEO PI-R consists of five scales of twelve items each that measure the five factors: Neuroticism (e.g., “I often get angry at the way people treat me”), Extraversion (e.g., “I really enjoy talking to people”), Openness to Experience (e.g., “I experienced a wide range of emotions or feelings”), Agreeableness (e.g., “Some people think of me as cold and calculating”), and
Conscientiousness (e.g., “I have a clear set of goals and work toward them in an orderly fashion”). Most respondents require 5 to 10 minutes to complete the measure.

Because the NEO FFI-3 is a shorted version of the full NEO Personality Inventory-Revised (NEO PI-R), its reliability and consistency are slightly lower than the full measure. However, the NEO FFI-3 has high construct validity, explaining about 90% as much variance as the full scale. Internal consistency for the NEO FFI-3 domains range from .66 to .88 (McCrae & Costa, 2010). Equivalence coefficients between the NEO FFI-3 and the corresponding full NEO PI-3 scales range from .87 to .95, showing that the NEO FFI-3 scales are good approximations of the full domain scale (McCrae & Costa, 2010).

**PLC quality survey.** The PLC quality measure was used to assess grade-level teams’ professional learning community quality—the degree to which PLC members feel cohesive, collegial, supported by their principal, and focus on their own professional learning (see Appendix D). The survey is a 7-point Likert scale (strongly disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, strongly agree).

Survey development required four steps and was based on pilot study work and pertinent theory. First, a faculty interaction quality survey was developed for the pilot study based on modifications of Shah’s *Teacher Collegiality Scale* (2011) and Hoy’s (2012) school measures of organizational citizenship and organizational climate. Analysis of the predictive value of the Faculty Interaction Quality Survey subscales showed that overall faculty interaction quality correlated with teacher effectiveness, but only four of the six subscales showed statistically significant positive correlations (please see Chapter
4 for more detailed pilot study results). Second, based on pilot study results and further examination of the relevant literature, the faculty interaction quality survey was reconceptualized to focus not on the entire faculty as the important social system influencing teacher effectiveness but instead to focus on PLCs as the focal social system. Third, further research on these four constructs was performed with an eye toward modifying questions so that they would have good construct validity when measuring PLC quality as opposed to faculty interaction quality. Literature on team boundaries (Faraj, & Yan, 2009), work group processes and performance (Bedeian, 2007; Carmeli, & Spreitzer, 2009; Chen, Tjosvold, Zhao, Ning, & Fu, 2011; Garvin, Edmondson, & Gino, 2008; Guo, Tan, Turner, & Xu, 2010; Hoiberg & Berry, 1978; Jehn, 1995), family relationships (King, King, Vogt, Knight, & Samper, 2003), and education (Cadiz, Sawyer, & Griffith, 2009; Leithwood, ;Schechter & Qadach, 2012) was synthesized to create the final PLC quality survey used for the current study. Fourth, the PLC quality survey was reviewed by three experts: one researcher versed in PLCs and survey design, an assistant principal of a school with PLCs, and a teacher who works in a PLC.

Reliability for each of the PLC quality subscales was calculated. Principal support was originally included as a subscale based on literature and pilot study qualitative findings. However, the reliability was low (α = -.02) and there were too few items in that subscale (five) to justify reducing items to increase reliability. Therefore, because this subscale was the least supported aspect of PLC quality in the literature and it was unreliable, it was eliminated from final analyses. The remaining three subscales showed excellent reliability, with reliability coefficients ranging from .92 to .94.
A Bayesian estimator of confirmatory factor analysis was used because of this study’s relatively small sample size. Cohesion and collegiality showed good fit. For learning orientation, after eliminating one item (item 40), the subscale showed good fit (please see Chapter 4, Table 6 for survey item descriptives).

**Interview protocol.** A semi-structured interview protocol originally developed for this study’s pilot study was modified based on the current study’s quantitative findings to capture teachers’ beliefs about what characterizes effective teaching and what are essential attributes of a high-quality PLC (please see Appendix E for the semi-structured interview protocol). To better explain relations between PLC membership, PLC collegiality, and teachers’ emotional support effectiveness, four teachers were purposefully selected for interviews to explore results gleaned from the surveys and observations. These teachers were those whose score on emotional support was in the top ten teachers and whose PLC mean collegiality was also in the top ten. Two of the four teachers invited agreed to participate in the interviews.

An example of an interview question used is, “how does your PLC influence your classroom performance?” Personalized follow-up prompts were used to probe teachers about their—and their PLC’s—visions of effective emotional support and PLC quality, particularly collegiality. The interviews ranged from approximately 40-55 minutes.

**The Classroom Assessment Scoring System (CLASS).** The CLASS (Pianta, La Paro, & Hamre, 2008) was used to measure teacher effectiveness. Each teacher was observed on one occasion between February and May 2014 for four observation cycles (approximately 20 minutes of coding followed by 5 minutes of rating). During each
coding cycle, 10 dimensions are coded, each on a Likert scale from 1 (low) to 7 (high). Previous research has consistently found that higher ratings are linked with better student academic and social outcomes (Burchinal et al., 2010).

The CLASS measures ten dimensions of teacher effectiveness that are aggregated into three domains. The first domain, Emotional Support (ES), includes: positive climate ($\alpha = .90$ for the current study), negative climate ($\alpha = .85$), teacher sensitivity ($\alpha = .91$), and regard for student perspectives ($\alpha = .89$). Positive climate refers to classrooms where teachers and children develop warm, supportive relationships and are respectful of each other. In classrooms with high positive climate, teachers and children clearly enjoy being together (Pianta et al., 2008). Negative climate refers to the level of expressed negativity such as anger, hostility or aggression by teachers and/or students. In classrooms with high negative climate, teachers and children appear angry or irritated and are disrespectful towards each other (Pianta et al., 2008). Teacher sensitivity is the extent to which teachers consistently, quickly, and effectively respond to students’ verbal or behavioral cues, providing comfort, reassurance, and encouragement while anticipating difficulty and providing appropriate support (Burchinal et al., 2010). Regard for student perspectives refers to teachers consistently emphasizing children's interests, motivation, and points of view by providing meaningful roles for students, encouraging them to talk, allowing them to make decisions when appropriate (Pianta et al., 2008).

Three dimensions are aggregated to form the Classroom Organization (CO) domain: behavior management ($\alpha = .89$ for the current study), productivity ($\alpha = .81$), and instructional learning formats ($\alpha = .82$). Behavior management refers to a teacher’s
ability to effectively prevent and redirect misbehavior by providing clear and consistently communicated rules and expectations for student behavior, including praise when students meet these expectations (Burchinal et al., 2010). Productivity describes classrooms that function like a well-oiled machine where students know what is expected of them and how do it—little to no instructional time is lost because of unclear expectations or lack of teacher preparation (Pianta et al., 2008). Instructional learning formats refers to ways in which teachers maximize students’ engagement and ability to learn lessons by including many learning modalities (visual, aural, and movement) and facilitating learning during whole group, small group and individual learning time (Pianta et al., 2008).

Three dimensions are aggregated to form the Instructional Support (IS) domain: concept development ($\alpha = .75$ for the current study), quality of feedback ($\alpha = .72$), and language modeling ($\alpha = .74$). Concept development describes teachers’ strategies to promote students’ higher order thinking and facilitate deeper understanding of concepts through problem-solving, integration, and instructional discussions rather than merely focusing on rote instruction and factual recall (Burchinal et al., 2010). Quality of feedback refers to teachers’ consistently providing specific feedback that expands student knowledge and builds on their task performance (Pianta et al., 2008). Language modeling describes teachers’ intentionally encourage, respond to, and expand on students’ speech (Pianta et al., 2008).

**Training and reliability.** To be certified as reliable, coders attend a two-day training followed by an online reliability assessment. Coders must be within one scale
point of the master-coded score on 80% of the dimensions across five 20-minute video segments. I completed prekindergarten CLASS training in January 2011. Coders must recertify yearly. I have recertified every year since 2011 and remain current in my Pre-K CLASS certification. To become certified to observe kindergarten through third-grade classrooms, I completed CLASS-approved self-study and passed the reliability test to become certified in observation of pre-K through third-grade classrooms in April 2013. I recertified in 2014 and remain current in my K-3 CLASS certification.

**Procedures**

**Recruitment.** Approval from George Mason University as well as school district review boards was granted. (Please see Appendix A for GMU’s review board approval). After receiving institutional review board approval, I contacted principals to ask permission to recruit their teachers for my study. Once principals agreed to my recruiting at their school, I recruited teachers in one of three ways: (1) an email alone; (2) email coupled with a study introduction at a faculty meeting; and (3) email coupled with meeting with teachers by grade-level during a PLC meeting to introduce the study. Consent forms were provided at our first meeting. Teachers were entered in a lottery for a chance to win one of five $50 Visa gift cards. I accepted all teachers who consented to participate, which meant that for many PLCs, not all members participated. Limiting participation to entire PLCs would have unacceptably limited the sample size. Therefore, any K-3 teachers willing to participate were included.
Data Collection Procedures

Survey completion. Surveys were offered online via SurveyMonkey or via pencil-and-paper. Of the 57 teachers who signed consent forms agreeing to participate in the study, 55 teachers completed the surveys. Surveying ran from February until May 2014.

Observations. Classroom observations using the CLASS observation instrument were conducted. This study used the K-3 CLASS to rate teacher effectiveness after observing each teacher in his/her classroom for approximately 100 minutes (four 20-minute cycles with each cycle followed by time to code). Observations took place from February until May 2014.

Interviews. Two participants were purposefully selected to participate in an audiotaped interview to explore connections between individual traits, PLC quality, and teacher classroom performance. The criteria for selection were for teachers to be in the top ten for both emotional support effectiveness and PLC mean collegiality. This was to explore the collegiality-teacher effectiveness connection. Because the study’s timeline could not accommodate many interviews, it was decided that selecting teachers in the upper echelons of the two variables of interest would provide the most illuminating findings. Four teachers fit the criteria and were invited for interviews in June 2014, after the end of the 2013-2014 school year. Two agreed to participate and were interviewed in early July 2014.

Table 3 provides a visual aid for aligning various study design elements.
Table 3

<table>
<thead>
<tr>
<th>Study Design Matrix</th>
<th>Data Collection</th>
<th>Scoring System</th>
<th>Data Analysis</th>
<th>Equations</th>
</tr>
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<td><strong>Research Question</strong></td>
<td><strong>Instrument</strong></td>
<td><strong>Scoring System</strong></td>
<td><strong>Technique</strong></td>
<td><strong>Equations</strong></td>
</tr>
<tr>
<td>How much variance in teacher effectiveness is accounted for by the PLCs the teachers are in?</td>
<td>Teacher demographic survey</td>
<td><em>NEO FFI-3</em>: 5-point Likert scale</td>
<td>Hierarchical Linear Modeling</td>
<td>Level 1: $Y_{ij} = \beta_{0j} + \gamma_{0i} + u_{0j}$</td>
</tr>
<tr>
<td>Do teacher background characteristics (education and experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and/or PLC quality (cohesion, collegiality, learning orientation)</td>
<td><em>NEO FFI-3</em> PLC Quality Survey</td>
<td>(strongly disagree, disagree, neutral, agree, strongly agree)</td>
<td>Pearson correlation</td>
<td>LEVEL 1: $Y_{ij} = \beta_{0j} + \beta_{1j} (EXPERIENCE) + \beta_{2j} (EDUCATION) + \beta_{3j} (OPENNESS) + \beta_{4j} (CONSCIENCIOUSNESS) + \beta_{5j} (EXTRAVERSION) + \beta_{6j} (AGREEABLENESS) + \beta_{7j} (NEUROTICISM) + r_{ij}$</td>
</tr>
<tr>
<td></td>
<td><em>CLASS</em> PLC Quality:</td>
<td></td>
<td>Hierarchical multiple regression</td>
<td></td>
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<td>Hierarchical Linear Modeling</td>
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<td>Level 2:</td>
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</table>
Does PLC personality composition (both individually and as a group) predict PLC quality and teacher effectiveness (CLASS domains)?

- **CLASS**: 7-point rating scale

\[ \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{COLLEGIALITY}) + \gamma_{02}(\text{COHESION}) + \gamma_{03}(\text{LEARNING}) + u_{0j1j} \]

\[ Y_{ij} = \beta_{0j} + \beta_{1j}(\text{EXPERIENCE}) + \beta_{2j}(\text{EDUCATION}) + \beta_{3j}(\text{OPENNESS}) + \beta_{4j}(\text{CONSCIENTIOUSNESS}) + \beta_{5j}(\text{EXTRAVERSION}) + \beta_{6j}(\text{AGREEABLENESS}) + \beta_{7j}(\text{NEUROTICISM}) + r_{ij} \]
What do highly effective teachers believe constitutes: 1) effective teaching (particularly emotionally supportive teaching) and 2) high-quality PLCs?

<table>
<thead>
<tr>
<th>What do highly effective teachers believe constitutes: 1) effective teaching (particularly emotionally supportive teaching) and 2) high-quality PLCs?</th>
<th>Semi-structured interviews</th>
<th>A priori categories for coding</th>
<th>Etic coding</th>
<th>Not applicable</th>
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</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Data Analysis

For the quantitative portion of the data, descriptive statistics, inferential statistics, hierarchical multiple regression, and hierarchical linear modeling (HLM) (Raudenbush & Bryk, 1992) features available in HLM 7.0 student edition software were used. Descriptive statistics, including frequencies, and measures of central tendency and variability were used to identify trends in the data. HLM allows researchers to take the data’s nested nature into account—in this case, where teachers are nested within PLCs. For the qualitative data analysis, etic coding using a priori categories identified through quantitative data analysis was used.

Including interviews was critical to gaining a better-rounded picture of how personality and PLC quality relate to teacher effectiveness. Conclusions about what contributes to teacher effectiveness can thus be triangulated with information collected from the three data sources: surveys, observations, and interviews.

Hierarchical Linear Modeling

Much social science research involves hierarchical data structures. Traditional statistical techniques are inadequate for modeling hierarchy (Raudenbush & Bryk, 1992). The current study has a two-level structure consisting of teachers (Level 1) nested within PLCs (Level 2). This study examined how teacher characteristics, including background characteristics and personality factors, and teachers’ PLC quality influence teacher effectiveness. Using HLM takes into account the nested nature of the data, whereby multiple teachers are nested within the same PLC.
The 57 participating teachers were divided into 30 PLCs. For some PLCs, only one teacher participated, whereas in the PLC with the most participants, all five teachers participated. The average number of participants per PLC was thus 1.9. In part, this is due to the size of the participating districts’ schools. PLC size at most schools ranged from two teachers to six teachers, with three or four being common. In many cases where I have a singleton in a PLC, she represents 33.3% to 50% of her PLC. When it comes to PLC research, this group size issue is widespread because having a handful or fewer classrooms per grade-level is probably representative of most schools across the U.S. To not use HLM because the number of observations per group is small or includes singletons would unnecessarily limit the scope of educational research. Doubtless, having small group sizes and singletons in groups is not ideal, but it does not preclude HLM analyses.

One way the question of whether nested data requires HLM analyses rather than general linear regression is answered by calculating the ICC (Peugh, 2010). If the proportion of variance in teacher effectiveness varies significantly across PLCs, HLM is appropriate. If predicted teacher effectiveness and errors in predicting it clusters by PLC, then the standard errors computed by general linear regression will be wrong (Garson, 2013). HLM allows for the likelihood that “individual-level observations from the same upper-level group will not be independent but rather will be more similar due to such factors as shared group history and group selection” processes (Garson, 2013, p. 6). Because of the two participating districts’ emphasis on elementary teachers’ PLC participation, the possibility that teacher effectiveness and perceptions of PLC quality is
attributable to teachers’ PLC membership needs to be tested. This was done by calculating whether there is significant variance at level-2, i.e., by calculating the ICC.

Although HLM has generally been regarded as an analytical method for large sample sizes, some researchers have recently found that small sample sizes and the inclusion of singletons does not necessarily preclude the use of HLM. In HLM, the number of groups is more important than the number of observations per group, and 30 PLCs is not unreasonably small (Clarke & Wheaton, 2007; Maas & Hox, 2005). Researchers note that lack of power remains a main issue in most cases, increasing the risk of a Type II error, unless very large effect sizes exist (Bell et al., 2010; Clarke & Wheaton, 2007; Maas & Hox, 2005).

To identify how problematic small group size is for HLM, Clarke and Wheaton (2007) investigated the effect of group sizes and the proportion of singleton groups on model performance, bias, and efficiency using simulated and real data. In their simulation study wherein they reduced their sample size including almost 60% of groups being singletons, they found unconditional multilevel modeling was not problematic. In the conditional models, when group size on average was much below two (1.43 in their simulation) with 60% singletons, between-group variance in the intercept can be inflated. The researchers found that in cases wherein 30% of groups were singletons, there was only a slight positive bias in group-level variance (Clarke & Wheaton, 2007). The current study’s average group size is close to two, with 48% of groups being singletons. This falls between the researchers’ two simulation cases of 60% in the first trial and 30% in
the second trial. Admittedly, the fact that some PLCs have small observations per group and are singletons is imperfect, but it is not overly problematic to warrant rejecting HLM.

Although caution should be used in interpreting some HLM findings when using small sample sizes, using HLM to detect whether PLC membership makes a difference to teacher effectiveness is a logical first analytical step in the current study and not one that would result in a Type I error. Conclusions about which variables predict teacher effectiveness are more likely to suffer from Type II error. Bell and colleagues (2010), in discussing HLM studies using small sample sizes and the use of singletons, write that “studies have consistently shown little to no bias in the estimates of fixed effects, regardless of level-1 or level-2 samples size” (p. 2). Although unconditional modeling and estimates of fixed effects have not been found to be overly problematic, various researchers note that small sample size can lead to biased variance inferences (Bell et al., 2010; Clarke & Wheaton, 2007; Maas & Hox, 2005). Based on this and other recent research, though the sample size is admittedly suboptimal, using HLM for the current study is an acceptable methodological decision. Nevertheless, conditional model variance estimates must be interpreted with caution but estimates of fixed effects are likely fairly reliable and the inferences drawn from those results more valid.

My first question asked, how much variance in teacher effectiveness is due to the PLCs the teachers are in? The first step in running HLMs is to run unconditional HLM models. These models divide the variance in each outcome (Overall Teacher Effectiveness, ES, CO, IS) into Level-1 variance (teachers) and Level-2 variance (PLCs) and can be represented by the equations:
Level 1 \( Y_{ij} = \beta_{0j} + r_{ij} \)

Level 2: \( \beta_{0j} = \gamma_{00} + u_{0j} \)

Subsequently, intraclass correlation coefficients (ICCs) can be calculated which summarize the proportion of variance that is at the PLC level.

My second question examines the degree to which teacher background characteristics (education, experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and PLC quality (collegiality, cohesion, learning orientation, principal support) predict teacher effectiveness (Overall Teacher Effectiveness, ES, CO, IS)? To answer this question, predictors were added to the unconditional models. A general model (for any outcome) can be represented by the following equations:

**LEVEL 1:**

\[
Y_{ij} = \beta_{0j} + \beta_{1j}(\text{EXPERIENCE}) + \beta_{2j}(\text{EDUCATION}) + \beta_{3j}(\text{OPENNESS}) + \beta_{4j}(\text{CONSCIENTIOUSNESS}) + \beta_{5j}(\text{EXTRAVERSION}) + \beta_{6j}(\text{AGREEABleness}) + \beta_{7j}(\text{NEUROTICISM}) + r_{ij}
\]

**LEVEL 2:**

\[
\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{COLLEGIALITY}) + \gamma_{02}(\text{COHESION}) + \gamma_{03}(\text{LEARNING}) + u_{0j} + r_{ij}
\]

Thus the outcome represented by \( Y_{ij} \) is equal to the PLC mean \( (\beta_{0j}) \), plus an effect of experience \( (\beta_{1j}) \), plus an effect of education \( (\beta_{2j}) \), plus an effect of Openness to Experience \( (\beta_{3j}) \), plus an effect of Conscientiousness \( (\beta_{4j}) \), plus an effect of Extraversion \( (\beta_{5j}) \), plus an effect of Agreeableness \( (\beta_{6j}) \), plus an effect of Neuroticism \( (\beta_{7j}) \), plus error \( (r_{ij}) \).
Hypotheses will be evaluated by examining whether beta weights for predictors of interest in the present study are statistically significant. Despite the fact that the outcomes are correlated, I expect some domain-specific relations with the predictors. In general, I expect predictors, when they are significant, to be positive, except for Neuroticism.

My third question asked the degree to which PLC personality composition (mean levels of personality factors) predict teacher effectiveness (ES, CO, IS) above and beyond individual team members’ personality characteristics? Level 1 will be retained from the prior model. This question will be answered by running two sets of analyses with different Level-2 predictors than the models used in answering question two. The first set will examine the degree to which mean PLC personality composition matters for teacher effectiveness above and beyond individual teachers’ personalities. Thus, personality on Level 1 will be entered as group-mean centered (italicized for clarity) reflecting each teacher’s deviation from the PLC mean. Then, PLC aggregate personality characteristics will be entered on Level 2 grand-mean centered reflecting each PLC’s deviation from the grand mean. These models can be represented by the following equations:

**LEVEL 1:**

\[ Y_{ij} = \beta_0j + \beta_{1j}(EXPERIENCE) + \beta_{2j}(EDUCATION) + \beta_{3j}(OPENNESS) + \beta_{4j} \\
\hspace{1cm} (CONSCIENTIOUSNESS) + \beta_{5j}(EXTRAVERSION) + \beta_{6j} \\
\hspace{1cm} (AGREEABLENESS) + \beta_{7j}(NEUROTICISM) + r_{ij} \]

**LEVEL 2:**

\[ \beta_{0j} = \gamma_{00} + \gamma_{01}(OPENNESS) + \gamma_{02}(CONSCIENTIOUSNESS) + \gamma_{03}(EXTRAVERSION) + \gamma_{04}(AGREEABLENESS) + \gamma_{04}(NEUROTICISM) + u_{0jij} \]
Qualitative Analysis

Research question four asked about the factors that highly effective teachers believe constitute effective teaching (particularly emotionally supportive teaching) and high-quality PLCs. This question is used to better understand the association between PLCs and emotionally supportive teaching that emerged as a result of quantitative data analysis.

Etic coding into categories that emerged as important as a result of quantitative analysis of survey and observation data was used to analyze the interviews. An emic approach, sometimes referred to as an “insider” or “bottom-up” approach, seeks to explain processes from the point of view of how native members of a phenomenon or culture make sense of it (Creswell, 2008). On the other hand, an etic approach, sometimes referred to as an “outsider” or “top-down” approach, uses researcher-defined concepts and perspectives to understand the process underlying a phenomenon or culture (Creswell, 2008). In analyzing the two teacher interviews, I noted themes when teachers discussed effective teaching and high-quality PLCs.

Reasons for using mixed methods include: developing better hypotheses, broadening interpretation of findings, triangulation, "to understand what is really going on," and to pursue unexpected findings (Greene, 2005, p. 406). The main reason Greene (2005) identifies for using mixed methods is to enhance the validity of study conclusions drawn from convergent results of different methods. Including observations and interviews in a research study allows for deeper, more contextualized data. Using mixed methods honors a phenomenon's complexity (Greene, 2005). Greene writes that "neither
distanced observation and measurement nor up-close engagement and interaction alone

Methods can be mixed in myriad ways. I mixed methods with an emphasis on

Indubitably, as Weisner (2005) writes, "all methods are incomplete and have biases" (p. 6). Because qualitative methods were used in this study, a brief discussion of my biases going into the interviews should be addressed. Biases are not much of an issue regarding the observation portion of this study because of the training and certification process associated with the class observation measure. Through training, CLASS observers practice compartmentalizing personal biases so they do not interfere with accurate coding. The effectiveness of this compartmentalization is assured through the certification process. Therefore, although observations can sometimes be influenced by researcher bias, the CLASS is mostly used as a quantitative tool that greatly minimizes any researcher bias to the point that reliability with other unknown researchers using the tool is achieved.
In contrast, I do enter into interviews with biases about effective teaching, which are comprised of my own experience teaching elementary school and the extensive research on effective teaching I have conducted. I am biased towards instructional styles that incorporate open-ended questioning of students, student discussion and hands-on learning, and an ordered, positive, and flexible classroom environment. Therefore, I try to keep in mind that I hold these biases so as not to influence participant statements about teaching effectiveness in one way or another.

An epistemological stance I hold as a researcher which affected not only my research questions but my choice in measures is that of being a realist. Realism generally assumes that there is a reality that exists independent of our perceptions (Maxwell, 2009). Many social scientists, particularly those who engage in qualitative research, are constructivists, maintaining that people’s understanding of reality is a social construction (Maxwell, 2011). This view, which acknowledges that there could therefore be various realities depending on a person’s history and perspectives, differs from realists’ view that an objective reality exists (Maxwell, 2011). There are many varieties of realism, ranging from direct realism on the one hand, which hold that people can perceive reality just as it is, to more sophisticated realism like critical realism on the other hand, which acknowledges that people’s perceptions of reality are affected by the views that they hold (Maxwell, 2009; Maxwell & Lincoln, 1989).

Although I hold the belief that each PLC has a real PLC quality that can be captured by surveying teachers, I also acknowledge that teacher perspectives (and personality) differ and influence their perceptions of PLC quality. Although I do not think
they matter to the point of being a constructivist, teachers’ experiences certainly shape their perception of their PLC’s quality. Therefore, mean scores of PLC quality subscales are most likely more accurate representations of PLC quality than any one teacher’s rating of her PLC. This point ties in with the above discussion of singleton PLCs represented in this study. Not only do singletons affect HLM, but PLC singletons’ ratings of PLC quality might then be less real than if more PLC members had participated and their scores were averaged to represent PLC quality. However, because I am not a constructivist, this issue is not overly problematic. It is not ideal, and the possibility exists that the singleton’s ratings are not completely accurate portrayals of PLC quality, but they are likely close enough that they should still be interpreted as valid representations of that PLC’s reality.

Summary

The current study used observations, surveys, and interviews to examine the predictive value of personality and PLC quality for teacher effectiveness. Because of the spread of PLCs across the U.S. as a mechanism for school improvement, teachers are often nested within groups, necessitating an examination of whether teachers’ perceptions of their group’s performance and teachers’ effectiveness are a function of their PLC membership. This possibility is explored in the current study and results are presented in the following chapter.
4. RESULTS

With many baby boomers retiring and the emphasis on school quality stronger than ever, effective teachers are in high demand. However, because of myriad education reform initiatives, including new CCSS and high-stakes testing in many states, teaching is increasingly demanding and stressful. One reform initiative that, if properly implemented, holds great promise in helping teachers adapt to the challenging teaching landscape is districts’ emphasis on teacher collaborating in PLCs. These new social systems may buffer teachers from excessive job stress and focus their collaborative work around improving teaching and learning. Although some research certainly supports the potential positive outcomes of teachers’ PLC participation, some research is not as optimistic. The current study is an attempt to clarify better predictors of effective teaching while considering teachers’ individual differences and PLC quality.

This study used survey instruments (demographics survey, NEO FFI-3, PLC quality survey), interviews, and CLASS teacher observations to study whether personality factors and PLC quality predict teacher effectiveness. Participants included 57 Kindergarten through grade 3 teachers from two urban public school districts in southern California. Each of these teachers works in one of 30 school-defined PLCs. Data analysis techniques included HLM, hierarchical multiple regression, and etic coding.
In this chapter, the dissertation results are discussed. Preceding that discussion is a presentation of the pilot study results because the pilot study helped shape the current study’s design and served to aid in development and testing of the PLC quality survey.

**Pilot Study Results**

The current study’s pilot study was a mixed methods study examining the association between faculty interaction quality and K-3 teacher effectiveness. Similar to the current study, the pilot study used survey instruments, interviews, and teacher observations. The study was primarily quantitative with teacher interviews being used to elaborate upon and explain relations between faculty interaction and teacher effectiveness.

Participants were 23 early childhood education teachers (kindergarten through grade three) from three suburban public schools serving kindergarten through grade five students in a mid-Atlantic state. Review of the data showed one outlier, who was removed from further analysis, resulting in a final sample size of 22 teachers.

Although the pilot study did not focus on PLCs, it should be noted that the school district implemented PLCs, requiring teachers to meet twice weekly to collaborate around instruction. Quantitative data collection—surveys and observations—occurred during spring 2013. Based on overall CLASS ratings, the three most effective teachers from grades kindergarten through grade two (one from each grade-level) were purposefully selected for interviews to explore results gleaned from the surveys and observations. There were too few third grade teachers to warrant their inclusion in the study’s interview phase. The three interviews took place in summer 2013.
Research questions were:

1. Do teacher background characteristics (education, experience) predict teacher effectiveness (aggregate of CLASS emotional support (ES), classroom organization (CO), and instructional support (IS) domains)?

2. Does faculty interaction quality (collegiality, cohesion, instructional press, principal support, trust, collective efficacy) predict teacher effectiveness (aggregate of CLASS emotional support (ES), classroom organization (CO), and instructional support (IS) domains)?

3. What do highly effective teachers believe contributes to their effectiveness?

Instruments

Demographic survey. To gather teacher background information, including years teaching, education level, gender, etc., a demographic survey was used that has been modified from the U.S. Department of Education’s Schools and Staffing Survey (SASS). The survey takes approximately five to ten minutes to complete.

Faculty interaction quality survey. The faculty interaction quality measure assesses the degree to which faculty interactions demonstrate cohesion (e.g., “teachers consider their colleagues as their friends”), collegiality (e.g., “most teachers in this school contribute actively to making decisions about curriculum”), collective efficacy (e.g., “teachers here don’t have the skills needed to produce meaningful student learning”), principal support (e.g., “the principal treats all faculty members as his or her equal”), instructional press (e.g., “my colleagues and I collectively analyze our teaching
practice”), and trust (e.g., “teachers in this school trust each other”). The survey uses a 7-point Likert scale (strongly disagree, disagree, somewhat disagree, neither disagree nor agree, somewhat agree, agree, strongly agree). The survey is based on modification of items from Shah’s Teacher Collegiality Scale (2011), Tschannen-Moran and Hoy’s (2003) faculty trust scale, and Hoy’s organizational citizenship and organizational climate school measures (available online at http://www.waynehoy.com/).

**Interview protocol.** A semi-structured interview protocol was developed to capture teachers’ beliefs about what makes them effective teachers. An example of a question used during the interview is, “What do you think helps you be an effective teacher?” Etic coding into themes identified in the survey was used to analyze the interviews.

**The Classroom Assessment Scoring System (CLASS)** (Pianta, La Paro, & Hamre, 2008). The CLASS was used to measure teacher effectiveness. Each teacher was observed on one occasion for four observation cycles. Each of the four cycles consisted of approximately twenty minutes of coding followed by five minutes of scoring. During each coding cycle, 10 dimensions of teacher effectiveness are coded, each on a Likert scale from 1 (low) to 7 (high).

**Pilot Study Findings**

To answer question one, “Do teacher background characteristics (education, experience) predict teacher effectiveness (aggregate of CLASS emotional support (ES), classroom organization (CO), and instructional support (IS) domains), an independent samples t-test was run to determine whether there were differences in teacher
effectiveness between teachers with a Master’s degree and those without a Master’s degree. The Levene’s Test for Equality of Variances shows that there are not equal variances, \( p = 0.60 \). The \( t \)-test for independent samples indicates that there is not a statistically significant difference in overall effectiveness between groups (B.A degree only and B.A. plus M.A. degree), \( t(20) = .25, p < .81 \). To determine whether teachers’ experience (years teaching) predicts overall teacher effectiveness, a correlation analysis was run. The Pearson correlation results between teacher experience and teacher effectiveness is negative and not significant, \( r(24) = -.05, p = .82 \).

To answer question two, “Does faculty interaction quality (collegiality, cohesion, instructional press, principal support, trust, collective efficacy) predict teacher effectiveness (aggregate of CLASS emotional support (ES), classroom organization (CO), and instructional support (IS) domains),” correlational analyses were run, followed by regression analyses. Results show that overall faculty interaction quality correlated with teacher effectiveness, but the trust subscale was not associated with the outcome measures (Table 4).

Table 4

<table>
<thead>
<tr>
<th>Measure</th>
<th>OTE</th>
<th>ESE</th>
<th>COE</th>
<th>ISE</th>
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<tr>
<td>FIQ</td>
<td>.47*</td>
<td>.41†</td>
<td>.48*</td>
<td>.43†</td>
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<td>Collegiality</td>
<td>.56**</td>
<td>.49*</td>
<td>.50*</td>
<td>.58**</td>
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<td>Cohesion</td>
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<td>.54**</td>
<td>.50†</td>
<td>.43*</td>
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<tr>
<td></td>
<td>.39†</td>
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<td>.36†</td>
<td>.44*</td>
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<td>--------------------------</td>
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</tr>
<tr>
<td>Instructional Press</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collective Efficacy</td>
<td>-.51*</td>
<td>-.51†</td>
<td>-.36†</td>
<td>-.57**</td>
</tr>
<tr>
<td>Principal Support</td>
<td>.33</td>
<td>.27</td>
<td>.37†</td>
<td>.24</td>
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<tr>
<td>Trust</td>
<td>.30</td>
<td>.33</td>
<td>.35</td>
<td>.28</td>
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</table>

*Note. One outlier was removed for the analyses. OTE = Overall Teacher Effectiveness; ESE = Emotional Support Effectiveness; COE = Classroom Organization Effectiveness; ISE = Instructional Support Effectiveness; FIQ = Faculty Interaction Quality.

†p < .10, *p < .05, **p < .01.

Based on correlational results, regression analyses focused on the value of using faculty interaction quality and collective efficacy for predicting teacher effectiveness. The final faculty interaction quality variable was comprised of four subscales: cohesion, collegiality, instructional press, and principal support. Reliability analyses showed acceptable internal consistency for all four subscales: cohesion (α = .71), collegiality (α = .76), instructional press (α = .92), and principal support (α = .86). Trust was removed because the subscale was not correlated with any of the outcomes. Collective efficacy was separated out of faculty interaction quality and input as a separate predictor because it behaved differently from the other subscales. It was also not significantly correlated with faculty interaction quality.

The results from the omnibus F-test for multiple regression indicated that the prediction of overall teacher effectiveness from faculty interaction quality (collegiality, cohesion, instructional press, principal support) and collective efficacy is statistically significant, $F (2, 19) = 7.63, p < .004$. Further, $R^2 = .45$ shows that 45% of the variance in overall teacher effectiveness is explained by the variance in all predictors together. The
regression equation under this model is \( TE = 0.215(\text{FIQ}) - 1.077(\text{CE}) + 49.412 + e \). Also, the \( p \)-values associated with the regression coefficients indicate that the regression coefficients for faculty interaction quality and collective efficacy are statistically significant at the \( p = .05 \) level. The squared part correlation for faculty interaction quality is \((.44^2) = .19\), which indicates that 19\% of the variance in teacher effectiveness is uniquely explained by faculty interaction quality. The squared part correlation for collective efficacy is \((-.38^2) = .14\), which indicates that 14\% of the variance in teacher effectiveness is uniquely explained by collective efficacy (Table 5). Visual examination of plots shows the data meet the assumptions for normality and homoscedasticity.

Interview findings indicate that teachers viewed four subscales of the PLC quality survey as being critical to their effectiveness including: principal support (allowing teachers time and freedom to make instructional decisions), group cohesion (teachers getting along), collegiality (planning together and sharing resources), and opportunities to learn together (teaching each other instructional techniques). Although quantitative analyses did not show principal support as a strong correlate of teacher effectiveness, it was retained as a possible predictor for the current study because each of the three teachers interviewed for the pilot study discussed the importance of principals allowing PLCs time to meet and work unfettered. Additional research on group performance further supported the inclusion of principal support. Because collective efficacy was related negatively to faculty interaction quality, it was not included as a variable in the current study.
Table 5

Multiple Regression Results for Predictors of Teacher Effectiveness in Pilot Study

<table>
<thead>
<tr>
<th>Predictor</th>
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<th>COE</th>
<th>ISE</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>β</td>
<td>$R^2$</td>
<td>β</td>
</tr>
<tr>
<td>FIQ</td>
<td>.19*</td>
<td>.45</td>
<td>.13†</td>
<td>.37</td>
</tr>
<tr>
<td>Collective Efficacy</td>
<td>.14*</td>
<td>-.40</td>
<td>.16*</td>
<td>-.42</td>
</tr>
</tbody>
</table>

Note. One outlier was removed for the analyses. OTE = Overall Teacher Effectiveness; ESE = Emotional Support Effectiveness; COE = Classroom Organization Effectiveness; ISE = Instructional Support Effectiveness; FIQ = Faculty Interaction Quality. †p < .10, *p < .05, **p < .01.

The pilot study influenced the dissertation study because the pilot study results urged me to examine PLCs as the school focal social system instead of continuing with examination of the entire faculty as the school focal social system. Teacher interview findings, as well as information gleaned from revisiting the literature, suggested that studying PLCs might increase utility of study inferences. The pilot study also helped craft subscales and items in the PLC quality survey.

**Dissertation Study Results**

**Preliminary Results**

For teachers’ education, an independent samples $t$ test was run to determine if there is a difference between teachers with or without Master’s degrees in teacher effectiveness in the three CLASS domains. The Levene’s Test for Equality of Variances shows that there are not equal variances, $p = .60$. Results of the independent-samples $t$ test show no statistically significant difference in teacher effectiveness in emotional support,
t(50) = 1.03, \( p = .31 \) based on teacher degree attainment. For classroom organization, the Levene’s Test for Equality of Variances shows that there are not equal variances, \( p = .36 \) and there was no statistically significant difference in teacher effectiveness in classroom organization, \( t(50) = 1.34, \ p = .19 \) based on teacher degree attainment. For instructional support, the Levene’s Test for Equality of Variances shows that there are not equal variances, \( p = .47 \) and there was no statistically significant difference in teacher effectiveness in instructional support \( t(50) = .18, \ p = .86 \) based on teacher degree attainment. There were too few teachers who had less than five years’ experience to determine if there was any difference in effectiveness between novice and experienced teachers.

**Descriptive Statistics**

The current study’s CLASS domain averages are similar to other studies’ average CLASS scores as presented by Hamre (2011). Her report showed that for the pre-Kindergarten through grade three version of CLASS, the one used for the current study, average scores for emotional support fall around the border of moderate and high-quality. Average scores for classroom organization fall around the upper end of moderate quality, and average scores for instructional support fall in the low range. The average CLASS ratings for teachers in this study (please see Table 6) closely resemble the distributions outlined by Hamre. Teachers were in the upper mid-range for emotional support and classroom organization, and the upper low-range for instructional support.
Table 6

Means and Standard Deviations of Teacher Effectiveness Domains

<table>
<thead>
<tr>
<th>Teacher effectiveness domain</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional support</td>
<td>54</td>
<td>5.85</td>
<td>.77</td>
</tr>
<tr>
<td>Classroom organization</td>
<td>54</td>
<td>5.75</td>
<td>.85</td>
</tr>
<tr>
<td>Instructional support</td>
<td>54</td>
<td>2.68</td>
<td>.72</td>
</tr>
<tr>
<td>Overall teacher effectiveness</td>
<td>54</td>
<td>4.76</td>
<td>.70</td>
</tr>
</tbody>
</table>

Note. Each domain score is the average of the dimension scores. The CLASS yields a score from 1-7. 1 and 2 are considered to be in the low-range, 3, 4, and 5 are considered mid-range, and 6 and 7 are high-range scores.

Mean scores for the five personality factors show that most teachers in the study scored close to the average range on the five factors. Participating teacher means for Extraversion, Agreeableness, and Neuroticism fell in the average range according to norms provided by McCrae and Costa (2010). Although Table 8 shows that the majority of teachers were in the high range in Openness to Experience and Conscientiousness, the means of these variables were not much above normal: the Openness to Experience mean was only .55 above the average range and the Conscientiousness mean was only .93 above the average range. These results suggest, on average, kindergarten through grade three teachers are no more extreme in any personality factor compared to the general population. All five personality factors except Conscientiousness passed both visual inspection of normality and the Shapiro-Wilk test for normality. However, after removing the outlier for Conscientiousness described in the participants section, it passed tests for normality as well.
Table 7

Means and Standard Deviations of Five Personality Factors

<table>
<thead>
<tr>
<th>Personality Factor</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness to Experience</td>
<td>55</td>
<td>32.55</td>
<td>5.67</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>54</td>
<td>35.93</td>
<td>5.36</td>
</tr>
<tr>
<td>Extraversion</td>
<td>55</td>
<td>30.56</td>
<td>5.51</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>55</td>
<td>35.07</td>
<td>5.72</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>55</td>
<td>18.27</td>
<td>6.73</td>
</tr>
</tbody>
</table>

Note. The combined (male and female) norms were used. For Openness to Experience, a score of 0-18 is very low, 19-24 is low, 25-31 is average, 32-38 is high, and 39-44 + is very high. For Conscientiousness, a score of 0-22 is very low, 23-29 is low, 30-35 is average, 36-42 is high, and 43-48 + is very high. For Extraversion, a score of 0-18 is very low, 19-24 is low, 25-31 is average, 32-37 is high, and 38-44 + is very high. For Agreeableness, a score of 0-22 is very low, 23-28 is low, 29-35 is average, 36-41 is high, and 42-47 + is very high. For Neuroticism, a score of 0-8 is very low, 9-16 is low, 17-25 is average, 26-32 is high, and 33-40 + is very high.

Frequencies for the five factors based on the score categories identified by the NEO FFI-3 are reported in Table 8.

Table 8

Five Factor Frequencies by Category for Combined Populations

<table>
<thead>
<tr>
<th>Personality Factor</th>
<th>Very Low</th>
<th>Low</th>
<th>Average</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
</table>

Survey results show that teachers felt that they meet with their PLC formally and informally fairly frequently (Table 9). Because both districts require teachers to work in PLCs, results showing that teachers at least meet sometimes are expected. Nevertheless, the districts require formal PLC meetings once (SUSD) or twice (PUSD) a month, which is not very frequent and leaves much room open for variability between PLCs, demonstrated by standard deviations which are quite large.

Table 9

<table>
<thead>
<tr>
<th>Item</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reported frequency of formally meeting to discuss instructional issues</td>
<td>55</td>
<td>3.35</td>
<td>.93</td>
</tr>
<tr>
<td>Reported frequency of informally meeting to discuss instructional issues</td>
<td>55</td>
<td>3.36</td>
<td>.70</td>
</tr>
</tbody>
</table>

*Note. The two items have a four-point Likert scale: never (1), seldom (2), sometimes
Most teachers were neutral or positive about their PLC’s quality (please see Table 10). Teachers rated collegiality as the highest and learning orientation the lowest quality compared to the other two PLC quality subscales. The three subscales retained for the final analyses showed good fit and reliability see Table 11).

Table 10

<table>
<thead>
<tr>
<th>PLC Quality Subscale</th>
<th>n</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesion</td>
<td>55</td>
<td>4.96</td>
<td>1.21</td>
</tr>
<tr>
<td>Collegiality</td>
<td>55</td>
<td>5.08</td>
<td>.96</td>
</tr>
<tr>
<td>Learning Orientation</td>
<td>55</td>
<td>4.75</td>
<td>1.06</td>
</tr>
</tbody>
</table>

*Note.* The PLC quality scale is based on a 7-point Likert scale: strongly disagree (1), disagree (2), somewhat disagree (3), neither agree nor disagree (4), somewhat agree (5), agree (6), and strongly agree (7). Negatively worded items were reverse scored, so a higher mean indicates greater magnitude of each subscale.

Table 11

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohesion</td>
<td></td>
<td></td>
<td>.92</td>
</tr>
<tr>
<td>PLC members provide strong social support for each other.</td>
<td>5.09</td>
<td>1.67</td>
<td></td>
</tr>
</tbody>
</table>
We enjoy working in PLCs. 4.85 1.60
PLC members like each other. 5.80 1.18
Teachers have fun socializing together during school time. 5.36 1.45
PLC members invite each other to visit them at home. 3.67 1.86
I look forward to coming to PLC meetings. 4.15 1.84
I feel included in my PLC. 5.64 1.24
In spite of individual differences, a feeling of unity exists in my PLC. 5.28 1.47

In spite of individual differences, a feeling of unity exists in my PLC.

Compared to other PLCs, our PLC is better than most. 4.45 1.89
I want to remain a member of this PLC. 5.35 1.54

Collegiality

Most teachers in this PLC contribute actively to making decisions about curriculum. 4.91 1.63
PLC meetings are useless.* 4.98 1.81
The majority of the teachers participate actively in PLC meetings. 5.27 1.42
Even when PLC members disagree, we communicate respect for each other. 5.72 1.19
We work for decisions we all accept. 5.62 1.08
PLC members are afraid to say what is on their minds. * 5.40 1.51
There is arguing among PLC members.* 5.15 1.73
PLC members share responsibilities. 5.56 1.25
It is easy to communicate with other PLC members.  
5.31  1.62

PLC members are open to listening to each other’s new ideas.  
5.65  1.38

PLC members are usually comfortable talking about problems and disagreements.  
5.13  1.49

Our PLC never pays attention to different views during our discussions.*  
5.30  1.56

If a conflict arises in our PLC, the people involved take steps to resolve the conflict immediately.  
5.24  1.31

Overly emotional displays (i.e., crying, yelling) are expected in my PLC.*  
6.29  1.01

Learning Orientation  
.94

I believe it to be beneficial for my teaching to be open with colleagues about my successes and challenges.  
6.09  1.13

Our PLC jointly plans and prepares teaching strategies and procedures.  
4.75  1.70

We often ask each other about classroom management ideas and suggestions.  
4.95  1.55

In our PLC, we often ask for suggestions to specific discipline problems.  
5.07  1.61

Our PLC frequently discusses school improvement strategies.  
4.15  1.62

PLC members often teach each other informally.  
5.42  1.12
We often share journal articles and educational books. 3.82 1.81
We regularly observe one another teaching as a part of sharing and improving instructional strategies. 2.02 1.10
I learn new skills and knowledge from collaborating with my PLC members. 5.53 1.40
Instructional experimentation and change are not important to our PLC.* 5.27 1.46
What I learn in my PLC improves my teaching. 5.15 1.53
In our PLC, we generate new ideas about teaching and learning. 5.35 1.34
Our PLC systematically collects student data to assess our teaching success. 4.18 1.91
Our PLC works together to modify subject matter for students. 4.73 1.75
PLC meetings evaluate student academic achievement. 4.91 1.53
We change our instruction on the basis of feedback from PLC members. 4.64 1.37
We change our instruction on the basis of student data analysis. 4.56 1.80
In our PLC, we evaluate our instructional practice. 4.49 1.57
Our PLC encourages openness to change. 5.11 1.54

Note. The PLC quality scale is based on a 7-point Likert scale: strongly disagree (1), disagree (2), somewhat disagree (3), neither agree nor disagree (4), somewhat agree (5), agree (6), and strongly agree (7). Negatively worded items are identified with an asterisk and were reverse scored.
Correlation coefficients were computed among thirteen variables: the five personality factors, three PLC quality variables, three teacher effectiveness domains, and two measures of PLC meeting frequency. A $p$ value of less than .1 was considered significant. The results of the correlational analyses presented in Table 12 show that personality factors correlate with a number of other variables, including: other personality factors, PLC quality subscales, teacher effectiveness, and PLC meeting frequency.

It is interesting but somewhat unsurprising that personality factors relate to each other. Openness to Experience correlated positively with Conscientiousness and negatively with Agreeableness. Conscientiousness also correlated positively with Extraversion and negatively with Neuroticism. Extraversion also positively correlated with Agreeableness. Agreeableness correlates negatively with Neuroticism as well.

Two personality factors correlated with PLC quality subscales. When teachers are more extraverted or agreeable, they are more likely to report that their PLC has a learning orientation. Agreeableness also correlated positively with cohesion and collegiality. Agreeableness was the only personality factor to correlate with any of the effectiveness domains. It correlated negatively with teachers’ effectiveness in providing instructional support.

PLC quality correlated with one teacher effectiveness domain and correlated to meeting frequency. The only PLC quality subscale that correlated with teacher effectiveness was learning orientation, which was negatively and marginally related to teacher effectiveness in classroom organization, $p = .09$. Both formal and informal PLC meeting frequency significantly and positively correlated to cohesion, collegiality, and
learning orientation. PLC meeting frequency correlated with one personality factor, Openness to Experience, and with all three PLC quality subscales. The more open to experience a teacher is, the more frequently she reports her team meeting formally, at scheduled times.
### Table 12

**Zero-order Correlations Among Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Openness</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2. Conscientiousness</td>
<td>0.33*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>3. Extraversion</td>
<td>-0.14</td>
<td>0.28*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Agreeableness</td>
<td>-0.28*</td>
<td>0.18</td>
<td>0.43**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Neuroticism</td>
<td>0.19</td>
<td>-0.30*</td>
<td>-0.11</td>
<td>-0.34*</td>
<td>1.00</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>6. Cohesion</td>
<td>0.07</td>
<td>0.07</td>
<td>0.18</td>
<td>0.24†</td>
<td>-0.14</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Collegiality</td>
<td>0.08</td>
<td>0.03</td>
<td>0.22</td>
<td>0.29*</td>
<td>-0.17</td>
<td>0.89**</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Learning Orientation</td>
<td>0.02</td>
<td>0.17</td>
<td>0.31*</td>
<td>0.34*</td>
<td>-0.19</td>
<td>0.77**</td>
<td>0.73**</td>
<td>1.00</td>
<td></td>
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</tr>
<tr>
<td>9. Emotional Support</td>
<td>0.09</td>
<td>0.11</td>
<td>-0.03</td>
<td>-0.14</td>
<td>0.06</td>
<td>0.05</td>
<td>0.02</td>
<td>-0.02</td>
<td>1.00</td>
<td></td>
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<tr>
<td>10. Classroom Organization</td>
<td>-0.03</td>
<td>0.07</td>
<td>-0.06</td>
<td>-0.14</td>
<td>0.09</td>
<td>-0.08</td>
<td>-0.09</td>
<td>-0.24†</td>
<td>0.81**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Instructional Support</td>
<td>0.09</td>
<td>0.02</td>
<td>0.03</td>
<td>-0.29*</td>
<td>0.21</td>
<td>0.08</td>
<td>0.02</td>
<td>-0.02</td>
<td>0.66**</td>
<td>0.64**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Frequency of formal meetings</td>
<td>0.34*</td>
<td>0.04</td>
<td>0.04</td>
<td>-0.10</td>
<td>0.07</td>
<td>0.31*</td>
<td>0.28*</td>
<td>0.42**</td>
<td>-0.14</td>
<td>-0.17</td>
<td>0.10</td>
<td>1.00</td>
<td></td>
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<tr>
<td></td>
<td>13. Frequency of informal meetings</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>-.02</td>
<td>.08</td>
<td>.04</td>
<td>.21</td>
<td>.00</td>
<td>.36**</td>
<td>.32*</td>
<td>.43**</td>
<td>-.20</td>
<td>-.08</td>
<td>.08</td>
<td>.09</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note.* †p < .10, *p < .05, **p < .01.
Research Question 1 Results

Research question one asked, “How much variance in teacher effectiveness is accounted for by the PLCs the teachers are in”? To answer research question one, unconditional HLM models were run for each of the three CLASS domains to calculate intraclass correlation coefficients (ICCs). The unconditional model run is represented by the following two equations:

Level 1: \( Y_{ij} = \beta_{0j} + r_{ij} \)

Level 2: \( \beta_{0j} = \gamma_{00} + u_{0j} \)

The results of the unconditional model showed significant variance in emotional support depending on PLC, \( p = .03 \). The ICC describes the proportion of variance associated with differences between PLCs, where \( \tau_{00} \) is the PLC-level variance and \( \sigma^2 \) is the teacher-level variance. In other words, the ICC indicates the extent to which individual ratings (in this study, teachers’ ratings) are attributable to group membership (PLC membership) (LeBreton & Senter, 2008). For the unconditional model, substituting variance estimates into the following ICC equation: \( ICC = \tau_{00}/( \tau_{00} + \sigma^2) \) showed that 25.08% (ICC = \( .15221/[.15221+.45470] = .2508 \)) of the variance in emotional support effectiveness can be explained by differences between PLCs. An ICC value of .25 may be considered a “large” effect (LeBreton & Senter, 2008, p. 838). Neither of the unconditional models for classroom organization or instructional support domains was significant.
Research Question Two Results

Research question two asked, “Do teacher background characteristics (education and experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and/or PLC quality (cohesion, collegiality, learning orientation) predict teacher effectiveness (CLASS’s emotional support (ES), classroom organization (CO), instructional support (IS) domains)?” Because there is a PLC effect (level 2) on the intercept of teachers’ emotional support effectiveness (level 1), ordinary regression methods will suffer from correlated error, and mixed modeling is required. Therefore, a two-level hierarchical model was created, with individual personality predictors at level 1 and PLC subscales as predictors at level 2. Because neither unconditional model for classroom organization nor instructional support showed significant variance at level 2, multiple regression—instead of HLM—was used to analyze the predictive value of personality and PLC quality for those two teacher effectiveness domains. Teacher background characteristics were not significantly correlated with any variables and were not significant in any HLM models, so education and experience were eliminated as possible predictors.

Recent research on the effects of personality shows that personality factors might not always have a linear relation with outcomes (Arthur, Woehr, & Graziano, 2001; Carter et al., 2014; Grant & Schwartz, 2011; Pierce & Arguinis, 2013). This possibility was explored before running regressions by visually inspecting a scatterplot matrix of variables. Best fit lines showed curvilinear relations between some variables. The two outcomes for which this was the case are teacher effectiveness in providing instructional
support and PLC learning orientation. For these two outcomes, hierarchical multiple regression was used to test whether $R^2$ change would be significant if a quadratic model was adopted (please see Table 13 and Table 14).

**Predicting emotional support effectiveness.** The following two equations represent the conditional model for emotional support effectiveness:

**LEVEL 1:**

\[ Y_{ij} = \beta_{0j} + \beta_{1j}(\text{OPENNESS}) + \beta_{2j}(\text{CONSCIENTIOUSNESS}) + \beta_{3j}(\text{EXTRAVERSION}) + \beta_{4j}(\text{AGREEABLENESS}) + \beta_{5j}(\text{NEUROTICISM}) + r_{ij} \]

**LEVEL 2:**

\[ \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{COLLEGIALITY}) + \gamma_{02}(\text{COHESION}) + \gamma_{03}(\text{LEARNING}) + u_{0ij} \]

In this model, the only significant predictor was collegiality, ($\beta = .5, t = 2.08, p = .05$). Thus, teachers’ emotional support effectiveness is higher when they are part of a highly collegial PLC.

**Predicting classroom organization effectiveness.** The omnibus $F$-test for multiple regression showed that the prediction of classroom organization from all five personality predictors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) is not statistically significant, $F (5, 45) = .63, p = .68$. None of the $p$-values of any of the predictors’ regression coefficients was statistically significant.

The omnibus $F$-test for multiple regression showed that the prediction of classroom organization from all three PLC predictors together (PLC cohesion, PLC
collegiality, and PLC learning orientation) is not statistically significant, $F(3, 48) = 1.45$, $p = .24$. However, the $p$-value of the regression coefficient for PLC learning orientation was statistically significant, $p = .05$. The squared part correlation for PLC learning orientation is $(-.28)^2 = .08$, which means 8% of the variance in classroom organization is uniquely explained by the variance in PLC learning orientation.

**Predicting instructional support effectiveness.** Two multiple regression analyses were conducted to predict teacher effectiveness in providing instructional support. One analysis included the five personality factors as predictors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism), while the second analysis included Extraversion squared. The regression equation with just the five factors was not significant, $R^2 = .14$, $F(5, 44) = 1.40$, $p = .24$. However, the regression equation with the quadratic component was significant, $R^2 = .26$, $F(6, 43) = 2.48$, $p = .04$, meaning that 26% of the variance in teachers’ instructional support effectiveness is explained by individual teacher personality. As shown in Table 13, because adding a quadratic component to the model produced a significant increase in fit, the quadratic model was adopted. Of the personality factors, Extraversion was the strongest predictor, with its relation to instructional support being curvilinear. Figure 2 shows the scatterplot depicting the nature of the relationship—average levels of Extraversion being associated with higher levels of instructional support. Agreeableness was also a significant predictor of teacher instructional support effectiveness, with the relation being negative.
Table 13

Summary of Hierarchical Regression Analysis for Personality Predicting Instructional Support

<table>
<thead>
<tr>
<th>Variable</th>
<th>(\beta)</th>
<th>SE (B)</th>
<th>(B)</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model 1</strong></td>
<td></td>
<td></td>
<td></td>
<td>.14</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>-.007</td>
<td>.023</td>
<td>-.055</td>
<td></td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.012</td>
<td>.024</td>
<td>.086</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.019</td>
<td>.024</td>
<td>.126</td>
<td></td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.044</td>
<td>.022</td>
<td>-.336*</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.016</td>
<td>.018</td>
<td>.145</td>
<td></td>
</tr>
<tr>
<td><strong>Model 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>.26*</td>
</tr>
<tr>
<td>Openness to Experience</td>
<td>-.005</td>
<td>.021</td>
<td>-.035</td>
<td></td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.014</td>
<td>.022</td>
<td>.096</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.487</td>
<td>.179</td>
<td>3.168**</td>
<td></td>
</tr>
<tr>
<td>Agreeableness</td>
<td>-.043</td>
<td>.020</td>
<td>-.323*</td>
<td></td>
</tr>
<tr>
<td>Neuroticism</td>
<td>.015</td>
<td>.017</td>
<td>.129</td>
<td></td>
</tr>
<tr>
<td>Extraversion(^2)</td>
<td>-.008</td>
<td>.003</td>
<td>-3.065*</td>
<td></td>
</tr>
</tbody>
</table>

Note. \(R^2_{\text{change}} = .12\) for Model 2 (\(p = .01\)).  
**\(p < .01\). * \(p < .05\).
The omnibus $F$-test for multiple regression showed that the prediction of instructional support from all three predictors (PLC cohesion, collegiality, and learning orientation) is not statistically significant, $F (3, 48) = .50, p = .68$. It should be noted that variance inflation factors (VIF) were checked and values were below 5.0. This suggests that even though cohesion and collegiality are highly correlated, the relation is not overly problematic to necessitate removing one of the predictors from the model. None of the $p$-values of any of the predictors’ regression coefficients was statistically significant.

**Research Question Three Results**

Research question three asked, “Does PLC personality composition (both individually and as a group) predict PLC quality and teacher effectiveness (CLASS domains)?” This question calls for identifying personality predictors of both PLC quality and teacher effectiveness.
Unconditional HLM models were analyzed to determine if teachers’ perceptions of PLC quality can be attributed to the PLC that there are in—if so, then HLM is the analytical technique that should be used to explore possible predictors of PLC quality. Unconditional models of the three PLC quality subscales—cohesion, collegiality, and learning orientation—showed that cohesion was the only subscale for which variance in the outcome is attributable to differences between PLCs, \( p = .04 \). For the unconditional model, substituting variance estimates into the following ICC equation: 

\[
\text{ICC} = \frac{\tau_{00}}{\tau_{00} + \sigma^2}
\]

showed that 22.02% of the variance in teachers’ perception of their PLC’s cohesion can be explained by differences between PLCs. Neither of the unconditional models for collegiality nor learning orientation was significant.

**Predicting PLC cohesion.** To determine if personality predicts PLC cohesion, a personality-only model was run with cohesion as the outcome. Personality variables were group-mean centered at level 1 (italicized for clarity) and grand-mean centered at level 2:

Level-1 Model

\[
Y_{ij} = \beta_{0j} + \beta_{1j} (OPENNESS) + \beta_{2j} (CONSCIENTIOUSNESS) + \beta_{3j} (EXTRAVERSION) + \beta_{4j} (AGREEABLENESS) + \beta_{5j} (NEUROTICISM) + r_{ij}
\]

Level-2 Model

\[
\beta_{0j} = \gamma_{00} + \gamma_{01} (OPENNESSMean) + \gamma_{02} (CONSCIENTIOUSNESSMean) + \gamma_{03} (EXTRAVERSIONMean) + \gamma_{04} (AGREEABLENESSMean) + \gamma_{05} (NEUROTICISMMean) + u_{0j1j}
\]
Results showed that no level 1 predictor is significant. At level 2, Agreeableness was significant ($\beta = .09, t = 2.34, p = .03$), as was Openness to Experience ($\beta = .09, t = 2.67, p = .01$). This indicates that PLCs whose members on average are more agreeable or open to experiences are more cohesive.

**Predicting PLC collegiality.** The omnibus $F$-test for multiple regression shows that the prediction of PLC collegiality from all five predictors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) is not statistically significant, $F(5, 48) = 1.92, p = .11$. The $p$-value of the regression coefficient for Openness to Experience approaches statistical significance, $p = .06$. The squared part correlation for Openness to Experience is $(.26)^2 = .07$, which means 7% of the variance in PLC collegiality is uniquely explained by the variance in Openness to Experience.

**Predicting PLC learning orientation.** Scatterplot examination revealed curvilinear relations between two personality factors (Openness to Experience and Neuroticism) and PLC learning orientation (Figures 3 and 4). Therefore, hierarchical multiple regression was employed to further investigate the nature of the relationship between personality and PLC quality. Two multiple regression analyses were conducted to predict PLC learning orientation. One analysis included the five personality factors as predictors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism), while the second analysis included Openness to Experience squared and Neuroticism squared. The regression equation with just the five factors was not significant, $R^2 = .17, F(5, 48) = 1.94, p = .11$. However, the regression equation with the quadratic component was significant, $R^2 = .31, F(7, 46) = 2.90, p = .01$. As shown in
Table 14, because adding a quadratic component to the model produced a significant increase in fit, the quadratic model was adopted. Of the personality factors, Neuroticism was the strongest predictor, with its relation to learning orientation being curvilinear. Figure 4 shows the scatterplot depicting the nature of the relationship—low or high levels of Neuroticism being associated with higher levels of PLC learning orientation. The regression coefficient for Openness to Experience approaches significance, with the relation being curvilinear. Figure 3 shows the scatterplot depicting the nature of the relationship—average levels of Openness to Experience being associated with higher levels of PLC learning orientation.

Table 14

<table>
<thead>
<tr>
<th>Summary of Hierarchical Regression Analysis for Personality Predicting PLC Learning Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Model 1</td>
</tr>
<tr>
<td>Openness to Experience</td>
</tr>
<tr>
<td>Conscientiousness</td>
</tr>
<tr>
<td>Extraversion</td>
</tr>
<tr>
<td>Agreeableness</td>
</tr>
<tr>
<td>Neuroticism</td>
</tr>
<tr>
<td>Model 2</td>
</tr>
<tr>
<td>Openness to Experience</td>
</tr>
</tbody>
</table>

167
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>-.025</td>
<td>.031</td>
<td>-.125</td>
</tr>
<tr>
<td>Extraversion</td>
<td>.033</td>
<td>.027</td>
<td>.169</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.036</td>
<td>.028</td>
<td>.195</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>-.259</td>
<td>.093</td>
<td>-1.639**</td>
</tr>
<tr>
<td>Openness to Experience$^2$</td>
<td>-.007</td>
<td>.004</td>
<td>-2.653†</td>
</tr>
<tr>
<td>Neuroticism$^2$</td>
<td>.006</td>
<td>.002</td>
<td>1.576**</td>
</tr>
</tbody>
</table>

Note. $R^2_{\text{change}} = .14$ for Model 2 ($p = .02$).  
** $p < .01$. * $p < .05$. † $p < .1$.

Figure 3. Scatterplot with fit line for Openness to Experience and PLC learning orientation.
Figure 4. Scatterplot with fit line for Neuroticism and PLC learning orientation

**Predicting teacher effectiveness.** To answer the second part of question three, whether group personality predicts teacher effectiveness, a personality-only model was run with emotional support as the outcome. Personality variables were group-mean centered at level 1 (italicized for clarity) and grand-mean centered at level 2. The conditional model for personality predicting emotional support effectiveness is as follows:

Level-1 Model

\[ Y_{ij} = \beta_{0j} + \beta_{1j}(OPENNESS) + \beta_{2j}(CONSCIENTIOUSNESS) + \beta_{3j}(EXTRAVERSION) + \beta_{4j}(AGREEABLENESS) + \beta_{5j}(NEUROTICISM) + r_{ij} \]

Level-2 Model
\[ \beta_{0j} = \gamma_{00} + \gamma_{01} \text{(OPENNESSMean)} + \gamma_{02} \text{(CONSCIENTIOUSNESSMean)} + \gamma_{03} \text{(EXTRAVERSIONMean)} + \gamma_{04} \text{(AGREEABLENESSMean)} + \gamma_{05} \text{(NEUROTICISMMean)} + u_{0j} \]

Results show that no level 1 predictor is significant. At level 2, Agreeableness was significant and negative (\(\beta = -0.04, t = -2.28, p = .03\)). This indicates that PLCs whose members on average are more agreeable provide less emotional support to their students.

Table 15

*Results from the HLM Analyses Examining the Contribution of Teacher Personality and PLC Quality to Teacher Effectiveness and PLC Cohesion*

<table>
<thead>
<tr>
<th>Variance Type</th>
<th>Emotional Support</th>
<th>PLC Cohesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLC variance</td>
<td>.15</td>
<td>.32</td>
</tr>
<tr>
<td>Teacher variance</td>
<td>.45</td>
<td>1.14</td>
</tr>
<tr>
<td>Total variance</td>
<td>.60</td>
<td>1.46</td>
</tr>
<tr>
<td>ICC</td>
<td>.25</td>
<td>.22</td>
</tr>
<tr>
<td>(p)</td>
<td>.03</td>
<td>.04</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>(\beta)</th>
<th>(df)</th>
<th>t-ratio</th>
<th>(\beta)</th>
<th>(df)</th>
<th>t-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.89</td>
<td>27</td>
<td>48.94**</td>
<td>4.97</td>
<td>28</td>
<td>27.54**</td>
</tr>
<tr>
<td>Mean PLC</td>
<td>-0.04</td>
<td>22</td>
<td>-2.28*</td>
<td>.09</td>
<td>23</td>
<td>2.34*</td>
</tr>
</tbody>
</table>

Agreeableness
Mean PLC  
Openness  
Not significant  
0.09  
23  
2.67*

Collegiality  
0.50  
24  
2.08*  
Not applicable

Note. HLM = hierarchical linear modeling; ICC = intraclass correlation  
The table represents information from the three conditional models described in above sections.  
†p < .10, *p < .05, **p < .01.

Qualitative Findings

Based on the quantitative results above, particularly HLM results that show variation in the emotional support domain of teacher effectiveness occurs across PLCs, the interview protocol was modified to further explore this relation. Criteria used for interviewee selection included being a top-ten most emotionally supportive teacher and belonging to a top-ten most collegial PLC. Four teachers fit these criteria and all were emailed an invitation to interview. Two agreed to participate.

Research Question Four Findings

Research question four asked, “What do highly effective teachers believe constitutes: (1) effective teaching (particularly emotionally supportive teaching) and (2) high-quality PLCs?” This interview focus was taken to explore what might account for the connection between collegiality and emotional support effectiveness (please see Appendix E for the semi-structured interview protocol).

Mrs. Smith is a third-grade teacher at a school in PUSD. She is one of four PLC members (all of whom participated in the study). Three of the PLC members have been teaching for many years and have known each other for over 20 years. Although the
district requires PLC meetings once every other week, Mrs. Smith’s PLC meets once a week. The second interviewee, Ms. Michaels, is a second-grade teacher who has been part of her PLC for ten years. She is one of five PLC members but was the only one who participated in the study. Her PLC meets formally every other week.

Mrs. Smith’s response to what constitutes effective teaching helps highlight why emotional support emerged as a teacher effectiveness domain influenced by PLC membership. She stated that indicators of effective teaching include “engaged, excited kids who are working together” on material that is “challenging work but students can access it together.” This description of a collaborative classroom is very much a description of one of the four dimensions comprising the emotional support domain of the CLASS: regard for student perspectives.

Ms. Michaels also mentioned the importance of student engagement when describing effective teaching. She stated that if a teacher is effective, her students are being questioned about their thinking and are involved in their learning. She feels that when teachers are effective, students understand what is expected of them, feel safe, exhibit proper etiquette, and treat each other with respect. Ms. Michaels feels that students should feel free to take risks and experiment, and feel obliged help their classmates. Ms. Michaels stated that enjoying children and recognizing their individuality is an important part of effective teaching, “you have to like kids...every class is different, every kid is different." To build an emotionally supportive classroom, Ms. Michaels focuses on community-building, closely monitors students' behavior, and always tries to
ensure she demonstrates the high standards she expects of her students—she states that "you have to model what you want from them."

Both teachers believe PLCs are crucial in helping teachers be highly effective. Mrs. Smith states that communication with other PLC members is invaluable in helping hone practice. She commented that PLCs are useful because meetings are a forum where teachers come to “share ideas and examine your own” as well. She feels that her PLC’s meetings were fruitful and facilitate teacher effectiveness because teachers can “work together so you're not in a bubble.” Ms. Michaels also clearly felt her PLC improved her teaching performance. She said her PLC helps her be effective by encouraging more structured lesson planning, formalized assessment, and student assessment data analysis.

What emerged quickly in the interview with Mrs. Smith is the highly structured nature of her PLC—member and meeting expectations are clear and meetings are predictable. Her PLC’s meetings are organized and efficient: they have an agenda prior to meetings, come prepared with materials for that week’s meetings, have designated roles, and “get to work.” Mrs. Smith’s PLC this past school year was composed of four teachers and they each had a role during meetings: (1) facilitator/leader, (2) note-taker, (3) time keeper, and (4) ideas person. These roles rotated weekly. Her PLC met every Friday for approximately 75 minutes. The facilitator for the week would email an agenda to other PLC members a few days prior so each teacher knew what to expect and what materials (data, lesson plans, curriculum guides, etc.) would be needed during the meeting. During the meeting, the note-taker recorded important discussions and decisions and would type up the notes and email them to other members within a few days of the meeting. The
time-keeper helped ensure all agenda items were accomplished efficiently and the ideas person was responsible for throwing out ideas to problems, however whacky they might seem at the time. Her PLC’s emphasis on staying focused, organized, and being open to creative solutions and dialogue was striking.

Although not quite as structured as Mrs. Smith's PLC, Mrs. Michaels's PLC also structured their formal meeting times. The grade-level team leader's meeting role was to be the group "mediator." It was her job to keep the group focused and on-task. Ms. Michaels reported that the leader did not hesitate to interrupt other members if necessary and members did not take it personally, recognizing that they needed to get back on-task. Ms. Michaels's PLC started the school year using a timer, which she felt was successful, but it was not a routine and sometimes her team forgot to use it.

The interview with Ms. Michaels underscores the importance of teachers having autonomy over their PLC meetings. She mentioned that, for a time, her principal provided PLCs with items to be discussed at their meetings. Ms. Michaels believes that the items were most likely supplied by the district. She greatly respects and admires her principal and mentioned that she rarely has to approach him about issues. However, her PLC found that the supplied PLC agenda items detracted from meeting productivity, so she went to speak with the principal to ask that PLCs be allowed to structure their own agendas. He agreed and the meetings went back to being teacher-driven. Ms. Michaels’s PLC focused mostly on SMART goals—at any given time, they would have one language arts and one math goal that they worked on. During meetings, they would
analyze data and whether their instruction was helping teachers meet their SMART goals. If not, they would discuss necessary curriculum and instruction modifications.

During my time recruiting and observing teachers, I informally talked with teachers and principals at both ends of the spectrum when it came to support for PLCs. Some teachers would take a few minutes to tell me how wonderful their PLC was—meetings were held regularly and instruction improved. Other teachers or principals mentioned that too often, PLCs were organized gripe sessions where teachers complained and commiserated with each other and did not get much accomplished. Because Mrs. Smith’s PLC meetings stood in stark contrast to this latter description of PLC, I asked about how/when her PLC used time to complain, and she stated that members “can gripe at other times,” but not during PLC meetings. When I asked her about these other times, she mentioned that PLC members often ate lunch together. Also, three of the four teachers’ classrooms were next to each other, so teachers had occasion to see each other frequently to chat (before/after school and recesses).

Taking into account Mrs. Smith’s statements about how long most PLCs members had worked together and the informal time they spent together, I thought examining her PLC’s cohesion score would be useful to understand its relation to her PLC’s collegiality. Mrs. Smith’s PLC’s average cohesion score (6.1 out of 7) was even higher than her group’s collegiality score (5.84 out of 7). This was also the case for Mrs. Michaels’s PLC cohesion score (6.10) compared to her group’s collegiality score (5.50). These results on the connection between cohesion and collegiality will be discussed in the next chapter.
Summary

In summary, personality factors predicted two domains of teacher effectiveness and two PLC quality subscales. Like many studies, neither teacher education nor years teaching related significantly to teacher effectiveness. Mean scores for the five personality factors show that most teachers in the study scored close to the average range on the five factors. The two exceptions were for Extraversion and Conscientiousness, but the mean for these two factors was close to norms provided by creators of the NEO FFI-3, McCrae and Costa (2010). Agreeableness emerged as an important correlate in the current study, having statistically significant relations to seven other study variables.

The three PLC quality subscales showed excellent reliability ($\alpha > .90$) and results showed that most teachers were neutral or positive about their PLC’s quality (please see Table 10). Teachers rated their PLCs’ collegiality the highest (5.08 on a 7-point scale) and learning orientation the lowest (4.75 on a 7-point scale). PLC formal and informal meeting frequency related to all three PLC subscales but not to teacher effectiveness. The only teacher effectiveness domain for which variance could be attributed to PLC membership was emotional support, with 25.08% of the variance in emotional support explained by differences between PLCs. For the conditional models run with emotional support effectiveness as an outcome, no level 1 predictor was significant. Collegiality was the only PLC quality subscale (level 2) that predicted emotional support effectiveness.

Personality predictors of teacher effectiveness include mean PLC Agreeableness (via HLM) for teachers’ effectiveness in providing emotional support and also (via
hierarchical multiple regression) for teachers’ effectiveness in providing instructional support. Both these associations were negative. Extraversion predicted teacher effectiveness in providing instructional support, with the relation being curvilinear. The only PLC quality subscale for which variance could be attributed to differences between PLCs was cohesion, with 22.02% of the variance in emotional support explained by differences between PLCs. For personality predictors of cohesion, no level 1 predictor was significant but PLCs’ mean Openness to Experience and mean Agreeableness (level 2) predicted PLC cohesion. For both factors, the association is positive. No predictor for collegiality was found. Hierarchical multiple regression results show Neuroticism predicts PLC learning orientation, with the association being curvilinear.

Both teachers interviewed strongly believed in the power of PLCs to improve teacher effectiveness. Three themes emerged as most relevant to explaining the quantitative results: 1) structured, focused PLC meetings, 2) autonomy over PLC meeting agendas, and 3) the connection between cohesion and collegiality. Important findings summarized in this section will be explained and elaborated upon in Chapter 5.
5. DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

This study extends our understanding of personality factors and job performance by looking at the relation in an occupational field that is not often included in such studies: teaching. The current study also included a measure of group process—PLC quality—as an important variable in understanding individual and group differences connected to teacher effectiveness. The PLC quality survey showed good fit and excellent reliability. In ratings of PLC quality subscales, teachers rated PLC collegiality the highest, followed by cohesion and then learning orientation. PLC formal and informal meeting frequency related to all three PLC subscales but not to teacher effectiveness.

Significant results for all research questions were found. These will be discussed by question in the following section. Results of quantitative data analysis show that emotional support effectiveness varied as a result of PLC membership, with 25.08% of the variance in emotional support explained by differences between PLCs, meaning that teachers’ PLC membership influenced the level of emotional support they provided their students. Personality variables related to teacher perceptions of PLC quality and to two domains of teacher effectiveness: emotional support and instructional support. In slight contrast to study hypotheses and previous job performance literature, Agreeableness emerged as an important personality factor in the study. It is the personality factor that correlated with the most variables (seven other variables). HLM showed PLC mean
Agreeableness predicts emotional support effectiveness, with the association being negative. This shows that the mean level of PLC members’ Agreeableness scores negatively predicted emotional support teachers provided to their students.

Teachers’ effectiveness in providing their students with emotional support was predicted by their PLC’s collegiality (positive relations) and by their PLC’s mean Agreeableness (negative relation). Teachers’ effectiveness in providing their students with instructional support was predicted by individual teacher Agreeableness (negative relation) and Extraversion (curvilinear relation). Average scores of Extraversion were associated with higher instructional support effectiveness.

Personality factors also related to teacher perceptions of PLC quality. Correlational analyses show that Agreeableness positively relates to all three PLC quality subscales. The only PLC quality subscale for which variance could be attributed to PLC membership was cohesion, with 22.02% of the variance in emotional support explained by differences between PLCs. For personality predictors of cohesion, no level 1 predictor was significant but PLCs’ mean Openness to Experience and mean Agreeableness (level 2) predicted PLC cohesion. For both factors, the association was positive.

Both teachers interviewed strongly believed in the power of PLCs to improve teacher effectiveness. Three themes emerged as most relevant to explaining the quantitative results: (1) structured, focused PLC meetings, (2) autonomy over PLC meeting agendas, and (3) the connection between cohesion and collegiality. In the following section, I discuss the findings around personality, PLC quality and teacher effectiveness.
Discussion

Research Question 1 Discussion

Research question one asked, “How much variance in teacher effectiveness is accounted for by the PLCs the teachers are in?” Although neither of the unconditional models for classroom organization or instructional support was significant, HLM analyses show that 25.08% of the variance in emotional support can be explained by differences between PLCs. This finding was initially surprising. Of the three teacher effectiveness domains, I would have thought emotional support to be the one least influenced by which PLC a teacher is in because the domain is captured many affective classroom features rather than technical instruction. However, taking the current education reform initiatives into account may help explain why PLCs affect teacher effectiveness in providing emotional support.

In understanding the connection between work teachers do in their PLCs and their emotional support effectiveness, it is first important to revisit what quality aspects are represented by the CLASS emotional support domain. The emotional support domain encompasses four dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspectives (Pianta et al., 2008). Positive climate represents respectful, warm interactions between teachers and students as well as cooperation, and engaging in shared activities. Negative climate, in addition to being maladaptive for child development, distracts from learning. It includes peer aggression, irritability, bullying and punitive control (Pianta et al., 2008). Teacher sensitivity reflects teachers’ awareness of and responsiveness to students’ academic and emotional needs and includes teacher
differentiation of instruction to accommodate these needs. This dimension also captures student comfort in participating in learning activities—the degree to which students take risks and engage with the teacher, peers, and to some extent, materials (Pianta et al., 2008). Regard for student perspectives reflects how much teachers structure activities around students’ interests, encourage student responsibility and autonomy, and elicit student expression (Pianta et al., 2008). This latter dimension in particular helps explain why differences between PLCs explain variance in teachers’ emotional support effectiveness.

Recognizing that the emotional support domain captures students working together, freely participating in learning, demonstrating responsibility and autonomy, and expressing their ideas and perspectives, facilitates understanding of why this domain connects with PLC participation. California teachers currently grapple with two education reform initiatives: CCSS and 21st century skills. California adopted the CCSS in 2010 (California Department of Education, 2012). Professional development around how to implement the standards is ongoing. As a matter of fact, 64% of the teachers in the current study who answered the demographics survey question on what professional development activities they had participated in during the past year explicitly mentioned CCSS. A major aspect of CCSS is increasing student collaboration and problem-solving. Professional development likely centers around this and PLC meetings might further emphasize how to change curriculum and instruction to align with the CCSS.

The indication that teachers might be emphasizing instruction that the emotional support domain of CLASS captures was further reinforced by teacher interviews. Much of
what both teachers described about effective teaching is captured by the CLASS’s emotional support domain. When asked about what emotionally supportive teaching looks like, Ms. Michaels described a classroom that mirrors many CLASS indicators: a respectful, positive climate where teachers are sensitive and responsive to student needs and students feel safe to take risks and are encouraged to work together and express themselves. When probed, teachers could not clarify whether these were instructional areas discussed in PLC meetings. However, both teachers felt that PLC members more or less help similar ideas about what effective teaching entails.

Instruction promoted by 21st century learning movement aligns not only with CCSS but also with the emotional support domain of the CLASS. For instance, Trilling and Fadel (2009) identify three conditions necessary to make high quality learning experiences possible: (1) very high levels of learning challenge driven by intrinsic motivation (regard for student perspectives dimension), (2) extremely high levels of teacher caring and personal support (positive climate and teacher sensitivity), and (3) complete safety for students to be able to fail (all dimensions). The CLASS is particularly well-designed to capture teachers’ effectiveness in implementing 21st century learning designs.

California’s CCSS reflect many 21st century skills. For instance, California’s CCSS in English Language Arts calls for students to engage in three ‘‘communicative modes’’: collaborative, interpretive, and productive (CA Department of Education, 2012, p. 16). These expectations call on students to ‘‘participate in meaningful, relevant, and intellectually challenging ways’’ (CA Department of Education, 2012, p. 19). Of these
communicative modes, the collaborative mode in particular closely aligns with the CLASS’s emotional support domain. Proficiencies students in the primary grades must demonstrate in this mode include: expressing their needs and ideas, responding to social and academic topics, and initiate and sustain dialogue with peers (CA Department of Education, 2012). Although some proficiencies outlined under the other two communication modes might also be captured by the emotional support domain, skills outlined under the collaborative mode are clearly represented. Teachers supporting students well in this area of the CCSS would be more effective in providing their students with emotional support.

Taking into account current education reform movements, new CCSS, and what kinds of professional development teachers are participating in, it is easy to understand why PLCs matter to teacher effectiveness in emotional support. Indeed, many of the skills being emphasized and taught to teachers and which teachers probably continue to focus on in PLC meetings are examples of quality indicators of CLASS’s emotional support domain.

**Research Question Two Discussion**

Research question two asked, “Do teacher background characteristics (education and experience), personality factors (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism) and/or PLC quality (cohesion, collegiality, learning orientation) predict teacher effectiveness (CLASS’s emotional support (ES), classroom organization (CO), instructional support (IS) domains)?” This question has two components: whether personality predicts teacher effectiveness and whether PLC
quality predicts teacher effectiveness. I briefly review the results below and follow that by first discussing the personality results and then PLC quality results in predicting teacher effectiveness.

Because unconditional HLM models showed that teachers’ effectiveness in providing emotional support could be attributed to between-PLC differences, a conditional HLM model was used to test predictors of emotional support effectiveness. In running the conditional model with emotional support effectiveness as an outcome, personality factors at level 1 and PLC quality subscales at level 2, the only statistically significant predictor was a level-two predictor, collegiality. No individual personality factor predicted teachers’ emotional support effectiveness.

The current study was not able to identify a predictor for teacher effectiveness in classroom organization. Multiple regression was used to analyze which variables (personality factors or PLC quality subscales) might predict teacher effectiveness in classroom organization. No regression model for predicting teachers’ classroom organization effectiveness was significant.

Personality factors, but not PLC quality subscales, predict teachers’ instructional support effectiveness. Because Extraversion was curvilinearly related to teachers’ instructional support effectiveness, hierarchical multiple regression was used. Results showed that $R^2$ change was significant ($R^2_{\text{change}} = .12$ for $p = .01$). The quadratic model explained 26% of the variance in teachers’ instructional support effectiveness (please see Chapter 4, Table 13). Personality—in particular, Extraversion and Agreeableness—is thus valuable in predicting teacher effectiveness in providing emotional support.
Discussion of research question two will focus first on personality’s value in predicting teacher effectiveness and second on PLC quality’s value in predicting teacher effectiveness.

**Personality and teachers’ instructional support effectiveness.** The only teacher effectiveness domain for which individual teacher personality predicted effectiveness was instructional support. The current study’s quantitative data analyses showed Extraversion and Agreeableness predict teacher effectiveness in the instructional support domain. Before turning to the literature to understand the associations, revisiting what the instructional support domain entails is an important first step.

The CLASS instructional support domain is comprised of three dimensions: (1) concept development, covering how teachers use instructional discussions and activities to promote students' higher-order thinking; (2) quality of feedback, representing how teachers extend students' thinking through responses to students' comments and work; and (3) language modeling, the extent to which teachers facilitate students' language development (Pianta et al., 2008). For teachers to score high in instructional support, they must be prepared to analyze children's responses and language to extend students’ conceptual understanding. Teachers must seek out and confront children's misunderstandings. Research shows that the quality of feedback dimension in particular predicts student academic achievement (Pianta et al., 2008). This is also the dimension which most calls for teachers to be aware and assertive in dealing with children's conceptual understanding. To score high on this dimension, teachers must engage in persistent back-and-forth exchanges with students, addressing student responses with
follow-up questions to have them explain their thinking, and providing specific feedback that expands children's learning (Pianta et al., 2008). Now I turn to how the research literature can help explain why Extraversion and Agreeableness predict teachers’ effectiveness in providing instructional support.

The dearth of high quality research studies assessing the predictive value of personality factors for teacher effectiveness (Chen & Watkins, 2010; Decker & Rimm-Kaufman, 2008; Harris & Rutledge, 2010; Radmacher & Martin, 2001; Rushton, Morgan, & Richard, 2007) complicates discussion of the current study’s results. Although some education research exists to inform the connection between personality and instructional support effectiveness, much of the discussion must be drawn from research fields outside education (e.g., I/O psychology, management literature).

**Extraversion.** Hierarchical multiple regression results indicated that Extraversion predicted teacher effectiveness in providing instructional support. The relationship is curvilinear (an inverted U-shape, please see Chapter 4, Figure 2), indicating that average levels of Extraversion predict higher levels of instructional support effectiveness. That increasing Extraversion relates to better instructional support was hypothesized. The fact that the relation was curvilinear was not hypothesized but recent research supports this pattern. Revisiting facets of Extraversion help to explain the results.

Looking to the facets comprising the Extraversion factor is a first step in understanding the curvilinear relation between the factor and teachers’ instructional support effectiveness. Extraversion is comprised of six facets: warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions (McCrae & Costa,
One can surmise that average levels of some of these facets would promote teacher effectiveness in instructional support better than others. For instance, assertiveness in particular relates to teachers’ ability to confront children’s misunderstandings. If teachers are not assertive enough, children’s misunderstandings might go unaddressed. However, too much assertiveness and children might be hesitant to volunteer their thinking and try novel approaches to activities. Activity might also relate to lesson planning more constructive activities that lead to higher scores on the concept development dimension. Too little activity and teachers’ lessons and engagement with children might be low. Too high and teachers might overwhelm children, not take the necessary time and pace to explore concepts deeply. More research involving Extraversion facets would certainly clarify why average levels of the factor relate positively to teachers’ instructional support effectiveness.

Extraversion has been identified in many studies as a positive predictor of work performance. In their seminal meta-analysis of personality’s prediction of job performance, Barrick and Mount (1991) found Extraversion predicted two of the five occupational fields—the most interpersonal occupations that they examined. In his meta-analysis, Salgado (1997) found Extraversion to be a positive job performance predictor for managers and police officers.

Other researchers have found Extraversion relates to teacher effectiveness, partially supporting my argument that some Extraversion facets might relate to teacher effectiveness more than others and therefore help explain the factor’s predictive value. Emmerich, Rock, and Trapani (2006) studied relations between teachers’ personality and
teaching quality. Participants were candidates seeking National Board for Professional Teaching Standards (NBPTS) certification in 14 teaching specialties from a population of first time NBPTS candidates who completed all 10 exercises required for certification during the 1999-2000 assessment year. The percentage of candidates passing the NBPTS assessments during that assessment year averaged about 54% across the 14 teaching specialties (Emmerich et al., 2006). To measure personality, the Air Force Self-description Inventory (AFSDI) (Christal, 1994, Tupes & Christal, 1992) was modified. To measure teacher performance, NBPTS assessments on 10 exercises were used. Emmerich and colleagues (2006) found that assertiveness, a facet of Extraversion, was more likely than the broad Extraversion factor itself to relate to quality teaching, concluding that in some cases, personality facets might have more predictive power that factors.

Several studies that examine personality’s relation to student evaluations of university faculty show Extraversion as a positive correlate or predictor (Radmacher & Martin, 2001; Sherman & Blackburn, 1975). However, as mentioned in Chapter 2, many of the methodological problems that make hypothesizing about personality’s influence on teacher effectiveness difficult also limits transferability of other studies’ conclusions to the current study. Two main problems are common. One, the measure of teacher effectiveness used in most of the education research studies using personality as a predictor are student evaluations of faculty, a measure that has uncertain construct validity. Two, valid personality measures are often not used. For instance, Radmacher and Martín (2001) used student evaluations of university faculty as their teacher
effectiveness measure. As their teacher personality measure, they added items to the evaluation measure to have students gauge faculty personality traits. The researchers found that Extraversion predicted student evaluation of teaching effectiveness.

Radmacher and Martin point out that their results "could be interpreted to support the fear of some faculty that student evaluations are just personality contests and may not be valid measures of teaching effectiveness" (p. 265). Other researchers who have found Extraversion relates to student evaluations of university faculty have also concluded that the possibility exists that, rather than extraverted professors actually being more effective, students are biased towards extraverted teachers (Patrick, 2011). The current study's results may support the researchers’ conclusion. However, another possibility is that high Extraversion might not be ideal in early childhood because young children could be overwhelmed by extremely gregarious and active teachers whereas college students are energized by them.

Results show that to a certain extent, Extraversion and teacher effectiveness were positively related, but beyond the upper edge of the average range, the relation becomes negative. Recently, researchers have found similar curvilinear results between personality factors and job performance. As Carter and colleagues (2014) write, “the inverted U-shaped relation between traits assumed to have positive outcomes no matter how high may, in fact, have a breaking point. Beyond this point, these traits are likely to be associated with (at best) limited gains in behavioral efficacy, and (at worst) maladaptive, extreme behavior” (p. 578). Because this is the first study to my knowledge that examines personality reliably and validly with experienced (not student or novice) elementary
teachers, comparisons with other studies at this time are not possible. However, the current study’s results certainly support the utility of checking the nature of Extraversion’s relation with a job performance outcome.

**Agreeableness.** Hierarchical multiple regression results indicated that Agreeableness was a significant predictor of teacher instructional support effectiveness, with the relation being negative. Agreeableness is comprised of the six facets of: trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness (McCrae & Costa, 2010). No education research article helps shed light on the current study’s finding that Agreeableness relates negatively. Outside of education, when Agreeableness has been found to relate to job performance, it tends to be a positive predictor. For example, Alessandri and Vecchio (2012) used the FFM to examine personality factors’ prediction of the job performance of insurance company workers and security agents. Individual job performance was measured using human resource department’s records of objective data—job sales—and subjective data—supervisor ratings. The researchers found that Agreeableness was highly positively correlated with job performance. Examining research that studies workers in other fields highlights the problem with the lack of education studies on the subject. Although some professions like nursing, social work, and counseling are similar to teaching in their emotional labor and unpredictable, challenging environments, many organizational psychology studies tend to focus on other professions like sales, security, and administrative work (Alessandri & Vecchio, 2012). Differences in job requirements are thus quite different. Further research in education—
such as examining personality and teacher effectiveness—are certainly needed to ascerta

The one association found for Agreeableness and occupational outcomes that somewhat relates to the current study’s results is that Agreeableness negatively relates to extrinsic work success, including promotion and salary (Judge, Higgins, Thoresen, & Barrick, 1999). Although extrinsic work success is a rather indirect representation of job performance, because agreeable people might not strive for higher status positions, this previous finding nonetheless is tangentially related to the current study’s finding that Agreeableness negatively relates to teacher instructional support effectiveness.

It is worth noting that logically, in some cases it might make sense that Agreeableness would be negatively related to job performance. As Judge and colleagues (1999) note, “one can also think of careers in which high levels of…agreeableness would be of little help or even a hindrance…extremely agreeable individuals may sacrifice their success in pleasing others” (p. 625). It is easy to see that high levels of the facets associated with Agreeableness do not coincide well with requirements for scoring high in instructional support, especially on the quality of feedback dimension. If teachers are too tender-minded, for instance, they might not be comfortable in pointing out children’s mistakes and taking a more Socratic style of instruction. This situation could conceivably be unique to early childhood education where, because not all students have yet mastered emotion regulation, some sensitive students might cry even when tactfully and sensitively given constructive feedback. Teachers must be willing to address student mistakes and misunderstandings, even it that might cause student discomfort and risk negative student
affect surfacing. When it comes to instructional support effectiveness, teachers cannot be too tender-minded towards their students and must be able to point out mistakes and press them as appropriate to expand their thinking.

**PLC collegiality and teachers’ emotional support effectiveness.** Collegiality in some ways mirrors the *CLASS*’s emotional support domain and the possibility exists that these are replicating structures. A classroom high in emotional support exhibits: (1) positive communication, (2) respectful relationships, (3) responsiveness to each other’s needs, (4) communication, and (5) flexibility. In many ways, these are hallmarks of PLC collegiality as I denote it. Collegiality subscale survey items which align emotional support indicators mentioned above include (1) “overly emotional displays (i.e., crying, yelling) are expected in my PLC,” (reverse coded), (2) “even when PLC members disagree, we communicate respect for each other,” (3) “if a conflict arises in our PLC, the people involved take steps to resolve the conflict immediately,” (4) “it is easy to communicate with other PLC members,” and (5) “PLC members are open to listening to each other’s new ideas” (please see Chapter 4, Table 11 for subscale items and descriptive analyses).

Two main possibilities exist for the connection between PLC collegiality and teacher effectiveness in providing emotional support. One possibility is that collegiality increases teacher efficacy and job satisfaction, leading to happier teachers who are more able to provide emotional support to students. Another possibility is that collegial PLCs more effectively discuss curriculum and instructional issues measured by the *CLASS*. Of course, some combination of these two possibilities is likely responsible for the positive
relation between collegiality and teacher effectiveness, but how that occurs is beyond the scope of this dissertation. In this section, I will first discuss the positive affective outcomes of PLC collegiality and then discuss the productive work performance that PLC collegiality might support.

Research literature shows that positive employee interactions and peer support may buffer employees from burnout (Leiter, Laschinger, Day, & Oore, 2011). Positive employee interactions allow colleagues to draw on each other’s knowledge and expertise, thereby increasing employees’ efficacy and satisfaction (Leiter, Laschinger, Day, & Oore, 2011).

In a learning environment, where teachers are expected to raise solutions to problems, diverse opinions and productive discussions should be encouraged. Although in these situations disagreements and differences are expected to arise, they should also be handled appropriately for the PLC to continue to function optimally. Much research supports the negative impacts of instability at work, for instance, that unresolved group conflict can deteriorate the quality of discourse and lead to emotional exhaustion (Leiter, Laschinger, Day, & Oore, 2011). The PLC quality measure’s collegiality subscale assesses the degree to which teachers feel PLC members participate in active listening, conflict resolution, and respectful disagreements.

PLC collegiality creates teacher learning conditions that allow teachers to learn new skills that enable them to teach more effectively. Researchers and theorists tout the power of collegial relationships to enhance teachers’ practice (Ayo & Fraser, 2008). Collegiality allows teachers to engage in learning through their professional, goal-driven
discussions. Researchers find that when group members effectively manage task conflict, group learning increases because the critical discussions leaders engage in during the task conflict leads to deeper understanding of the task (Chun & Choi, 2014). The current study measures this aspect of group processes; items in the PLC Quality collegiality subscale cover open communication and conflict resolution. Certainly, group members’ engagement in productive discussion and well-managed argumentation might be a process by which teacher effectiveness is improved.

As mentioned in chapter 2, empirical research on PLCs’ relation to teacher effectiveness is mixed, with some studies finding a positive association, others a negative one, and some studies finding no association at all. Given the literature on the positive effects of collaboration, studies that do not find positive outcomes of teacher collaboration should be scrutinized. Learning about conditions that do not lead to positive change elucidates conceptual development as much as studies that find positive results of teacher collaboration.

Construct validity of studies’ collaboration or PLC measures is extremely important. How researchers define concepts and represent them in survey items is critical. Examining one study that reports no association between teacher collaboration and student achievement demonstrates my point that scrutinizing research studies’ methods, particularly attending to measures’ construct validity, is imperative. In their study involving thousands of students, Miller and Rowan (2006) purport to examine the effects of distributed leadership and teacher collaboration on student achievement. The researchers examined reading and math achievement data collected from two cohorts of
elementary school students (approximately 5500 in one cohort and 5300 in the second) who were tracked from 1991 to 1994. The researchers described independent variables used in the study as being (1) supportive school leadership, (2) teacher control over instructional decision, and (3) staff collaboration/cooperation. The authors report that none of the independent variables had any effect on elementary student achievement or rates of achievement. At first glance, one might be tempted to accept this study as yet another example of research demonstrating PLCs are not useful. However, this would be premature. An examination of the research article’s appendices reveals how the researchers measured their staff collaboration/cooperation variable. The measure is comprised of four items, which teachers scored on a 1 (strongly disagree) to 6 (strongly agree) scale: "colleagues share beliefs about mission, teachers at the school are continually learning, great deal of cooperative effort among staff, broad agreement among faculty about mission" (p. 252). I would argue that this measure of their staff collaboration/cooperation does not demonstrate adequate construct validity.

Interestingly, a closer examination of Miller and Rowan’s (2006) results show that their study might actually support the positive effects of teacher collaboration. The researchers also examined effects of school organization variables on student achievement, and one of these was whether teachers had common planning time. Miller and Rowan found a positive relation between elementary teachers' common planning time and student achievement. Had the researchers used a different measure of staff collaboration/cooperation, one that measured what elementary teachers do during their common planning time, for instance, they likely would have found an association
between teacher collaboration and student achievement. It seems that when it comes to studying teacher collaboration, we must move towards a unified construct with a clear definition which most scholars endorse if we are to be able to come to more definite conclusions about the effects of teacher collaboration on teacher effectiveness.

**Research Question Three Discussion**

Research question three asked, “Does PLC personality composition (both individually and as a group) predict PLC quality and teacher effectiveness (CLASS domains)?” This research question necessitates two analyses, examining whether PLC personality composition predicts: (1) PLC quality and (2) teacher effectiveness. First, I will discuss PLC personality composition’s value in predicting PLC quality first and then discuss PLC personality composition’s value in predicting teacher effectiveness.

**Predicting PLC quality.** Personality was found to predict two of the three PLC quality subscales: cohesion and learning orientation. HLM analyses were used to test personality predictors of cohesion and hierarchical multiple regression analysis was used to test personality predictors of learning orientation. The findings are discussed below.

**Cohesion.** Because unconditional HLM models showed that teachers’ perceptions of their PLC’s cohesion could be attributed to PLC membership, a conditional HLM model was used to test personality predictors of PLC cohesion. In running a conditional model with group-centered personality factors at level-1 and grand mean-centered personality factors at level 2, the results showed that two level 2 predictors—PLC mean Agreeableness and mean Openness to Experience—were statistically significant, with both associations being positive. No individual personality factor predicted teachers’
perceptions of their PLC’s cohesion. Results that Agreeableness and Openness to Experience relate to PLC cohesion are in line with other research that finds these personality factors’ sensitivity to interpersonal, environmental influences (Ozer & Benet-Martinez, 2006).

These study results show that personality factors relate to teachers’ perceptions about their PLC’s cohesion: certain personalities are more likely to take pride in their PLC, enjoy PLC meetings, and view their fellow members as sources of strong social support. Agreeableness has been found to correlate strongly with prosocial behavior and Openness to Experience is related to forgiveness (Ozer & Benet-Martinez, 2006). Although Openness to Experience’s relation to interpersonal relationships is not well-documented in the literature, Agreeableness is strongly linked to interpersonal relationships and most certainly important to cohesive PLCs. Indeed, Ozer and Benet-Martinez (2006) write in their review of personality’s prediction of important outcomes that they were not able to find any well-documented connections in the interpersonal domain for Openness to Experience. This study is thus an important extension of personality research in finding that Openness to Experience predicts group cohesion. Personality—especially Agreeableness—inarguably relates to relationship quality and stability.

Although studies of personality and PLC quality are woefully scarce, turning to literature on how personality affects relationships helps shed light on why personality relates to PLC quality. For instance, numerous research studies show that personality factors predict not only relationship quality generally but also such important outcomes
as relationship dissolution and divorce, even surpassing the effects of socioeconomic status and IQ (Solomon & Jackson, 2014). Low levels of Agreeableness are related with relationship dissolution (Solomon & Jackson, 2014). Theorists hypothesize that personality influences relationship quality through its effects on individuals’ typical behaviors and communication patterns.

The connection between cohesion, which measures attitudes and feelings of PLC members rather than PLC behaviors, is predictable given the established connection between Agreeableness and interpersonal relationships. Indeed, in their study of team cohesion, Agreeableness, and team performance, Bradley and colleagues (2013) found results similar to mine. They found a nonsignificant negative association between mean team Agreeableness and team performance but a significant positive association between mean team agreeableness and cohesion. The researchers further posit that cohesion is important in teams, not only as a predictor of important outcomes, but as an outcome in its own right because of its function in linking team inputs and outputs, a conclusion I put forth as well. Although cohesion did not emerge as a predictor of teacher effectiveness in the study, it is likely an important precursor to high-quality PLC collegiality.

**Learning orientation.** Because unconditional HLM models showed that teachers’ perceptions of their PLC’s learning orientation was not a function of between-PLC differences, and scatterplot matrices showed curvilinear relations among two personality factors and PLC learning orientation, hierarchical multiple regression was used to test PLC personality composition’s value in predicting PLC learning orientation. Results showed that $R^2$ change was significant ($R^2_{\text{change}} = .14$ for $p = .02$) for the quadratic model,
with it explaining 31% of the variance in teachers’ perception of PLC learning orientation (please see Chapter 4, Table 14). Although Openness to Experience approached statistical significance, Neuroticism was the only statistically significant predictor of PLC learning orientation. Neuroticism is curvilinearly related to learning orientation. An examination of the scatterplot for Neuroticism and PLC learning orientation clarifies that lower or higher Neuroticism scores predict more learning orientation—i.e., the fit line is U-shaped. The finding that Neuroticism predicts PLC learning orientation makes sense in light of research showing that personality traits influence people’s orientation toward change (Daly, Liou, Tran, Cornelissen, & Park, 2014).

Interestingly, Neuroticism had a U-shaped curvilinear relation with PLC learning orientation. The fact that lower or higher scores of Neuroticism predict teacher perception of PLC learning orientation can likely partly be attributed to the Neuroticism facets. Low Neuroticism is often associated with positive outcomes, so the result that low Neuroticism predicts high levels of PLC learning orientation is not surprising. Emotionally stable teachers will likely go along with PLC or administration efforts to focus PLC meetings around curriculum and instruction.

The result that high Neuroticism relates to perceptions of more PLC learning orientation is less intuitive, but make sense if it is kept in mind that Neuroticism captures a person’s tendency towards anxiety and personal insecurity (Barrick, Mount, & Judge, 2001). Because this study used the NEO FFI-3 rather than the NEO PI-R, closer scrutiny of the current study’s data to identify whether certain facets are responsible for the relation is not possible, but future research would help clarify possible explanations for
this result. Indeed, scoring high on Neuroticism is not always maladaptive: some previous research shows that people who score high on Neuroticism can have certain advantageous outcomes. Higher anxiety has been associated with certain positive long-term outcomes (e.g., academic achievement, health behaviors) (Rosander, Backstrom, & Stenberg, 2011). In line with the current study’s results, Arthur and colleagues (2001) point out that some research supports a curvilinear U-shaped relation between Neuroticism and certain job performance outcomes. Individuals who tend towards anxiety or insecurity might be motivated to participate in the activities captured by the PLC learning orientation subscale, including asking advice about classroom management issues, collecting and analyzing student data, and instructional experimentation and change. The current study’s results lend support to calls by researchers to consider the possibility that personality variables often have nonlinear relations with outcomes (Arthur et al., 2001; Corr & Matthews, 2009).

**Predicting teacher effectiveness.** Mean PLC Agreeableness predicted teachers’ emotional support effectiveness. Among the personality factors in the current study, Agreeableness stands out. It relates to the most study variables and predicts teacher effectiveness. Indeed, researchers identify Agreeableness as the factor most connected with interpersonal relationships. Agreeableness stands out from the other four factors as being pervasive in social perception and social cognition (Graziano, 2009; Graziano, Jensen-Campbell, & Hair, 1996). Some theorists propose that Agreeableness relates to emotion regulation of anger and frustration (Graziano, 2009; Graziano et al., 1996). The fact that the current study's results showed that PLCs' mean Agreeableness negatively
relates to teacher effectiveness might be because teachers overregulate negative emotions, emphasizing group cohesion and harmony at the expense of group productivity. Instead of acting on the negative affect and expressing dissatisfaction with a proposal, a teacher might choose instead to manage emotions back down.

People high in Agreeableness project positivity onto others and make excuses for other people's shortcomings (Graziano, 2009). Studies show that people who score low on Agreeableness are less influenced by persuasive arguments than peers who score high on Agreeableness, regardless of the quality of the argument (Graziano, 2009). These findings help to explain the current study's results that groups with high mean Agreeableness teach less effectively. Possibly, they hold each other to lower standards, making excuses for their colleagues' shortcomings, and might also be more persuaded by less rigorous thinking about curriculum and instructional decisions.

Another similar explanation for the negative connection between PLC mean Agreeableness and teacher effectiveness certainly involves the lack of critical dialogue in PLCs with higher mean Agreeableness. Chun and Choi (2014), in their study examining conflict and group performance, found that some conflict actually improves group performance, as long as that conflict is effectively managed. Likewise, Ellis et al. (2003) found that team mean Agreeableness had a negative relation to team learning. The researchers assert that too much group compliance, deference, and conflict avoidance could be detrimental to team learning. If members are highly agreeable and go along with colleagues’ ideas at the expense of closer examination of curriculum and instruction, teacher effectiveness growth opportunities are lost.
Social neuroscience research supports the role of Agreeableness in influencing people's emotion regulation of negative stimuli. Haas, Omura, Constable, and Canli (2007) conducted fMRI research with 48 volunteers. Participants completed the NEO PI-R and participated in six trials consisting of a 1-s presentation of a fixation cross followed by a 2-s presentation of a stimulus. Results showed that Agreeableness is related to activation of the right lateral pre-frontal cortex following exposure to fear stimuli. The degree of activation was significantly related to people's Agreeableness scores. Because the researchers found that the automatic brain activation is specific to threat or conflict related signals, they conclude that Agreeableness affects regulation of aggression or conflict.

Other research reinforces that highly agreeable people might not only automatically regulate negative emotions but have coping mechanisms to deal with negative stimuli. Researchers have found differential reactions to aggressive and fearful stimuli based on participants' Agreeableness scores. Meier, Robinson, and Wilkowski (2006) researched people's reactions to aggressive priming according to their Agreeableness scores. They found that aggression-related primes led to aggressive behavior among people low in Agreeableness. In the second part of their study, the researchers found that aggression-related primes increased prosocial thoughts among individuals high in Agreeableness. This was a surprising finding and the researchers concluded that agreeable people have taught themselves to "turn the other cheek" (Meier, Robinson, & Wilkowski, p. 140).
In light of the current study’s finding that collegiality (addressing differences among PLC members, respectfully stating disagreements, etc.) positively relates to teacher effectiveness while group mean Agreeableness negatively relates to it, it is possible that PLCs with too many highly agreeable members do not confront differences assertively. In contrast, they may overregulate any negative feelings arising with opinion differences and gloss them over at the expense of improving PLC quality and teacher effectiveness.

My interview with Mrs. Michaels clarified why teachers who comprise a PLC with a high mean Agreeableness level might not be as effective in the classroom. Her discussion of the leader’s role in sometimes interrupting other PLC members to make sure the group stays focused and on-task is an example of how some assertive, nonconformist behavior is necessary for group productivity. A PLC that has highly agreeable members would likely be too permitting of teachers' ramblings and digressions and not challenge colleagues’ poor decisions.

Too much personality research focuses on the effect of individual Agreeableness scores on behavior instead of the effect of groups’ mean Agreeableness on behavioral outcomes (Graziano, Jensen-Campbell, & Hair, 1996). Because Agreeableness is associated with interpersonal relationships, studying it as an emergent quality elicited by certain social contexts and social partners increases understanding of how the factor operates at group level (Graziano et al., 1996). It should be clarified that even though researchers discuss groups as having mean personality levels, this should not be conceptualized as groups having a personality. Rather, the individual members’
aggregated scores are used as proxies. The current study is such an attempt and lends support to the argument that studying the influence on performance of group Agreeableness levels rather than just individual Agreeableness can have important theoretical consequences.

**Research Question Four Discussion**

Research question four asked, “What do highly effective teachers believe constitutes: (1) effective teaching (particularly emotionally supportive teaching) and (2) high-quality PLCs?” Interview questions were designed to shed light on the connection between PLCs and teacher effectiveness, particularly in providing emotional support. Three themes emerged as most relevant to explaining the quantitative results: (1) structured, focused PLC meetings, (2) autonomy over PLC meeting agendas, and (3) the connection between cohesion and collegiality.

**Structured, focused PLC meetings.** Interview findings with teachers stressed the value of PLC task orientation. Anderson and West’s (1998) definition of task orientation within work groups includes aspect of PLC structures that Mrs. Smith in particular, but also Ms. Michaels to some degree, mention: (1) emphasis on individual and group accountability, (2) control systems for evaluating and modifying performance, and (3) mutual monitoring. Mrs. Smith was very specific about group member expectations of each other, the fact that they evaluate their performance as a team, and that they monitor their group’s task orientation. Anderson and West emphasize the importance of studying the climate of work groups as opposed to the more popular research approach of studying the climate of the organization as a whole. Other researchers have also found support for
the importance of task orientation to group performance. Tabernero and colleagues (2009) conducted an experiment of 72 participants in 24 groups of three. One person from each group was randomly chosen to receive training in either task-oriented or relationship-oriented leadership. Task-oriented leaders learned to focus their group on goal achievement and communication patterns. Relationship-oriented leaders learned to focus on showing concern and respect for group members as well as expressing appreciation and support of group members. Then the work groups completed simulated tasks for during a 12-week program, which provided the team performance measure. The researchers also surveyed group members on group processes, perceived group efficacy, and perceptions of their team leaders. The researchers found that the leadership behaviors affected group performance. Task-oriented leaders’ group members reported greater group efficacy, more positive affect among group members, and better task accomplishment in comparison to groups with relationship-oriented leaders. Relationship-oriented leaders’ group members reported greater group cohesion. These results suggest the importance, as both Mrs. Smith and Ms. Michaels do, of group task orientation and the importance of having a group leader who orients the group to goal achievement.

When it comes to group task orientation and monitoring, both teachers mentioned the importance of delineated roles including the team leader and time keeper. An examination of the research shows that although much research emphasizes the importance of role clarity and structures, what roles are essential and why is more difficult to decipher. Humphrey, Morgeson, and Mannor (2009) write that although
much research exists on role differentiation in organizations, there has been little discussion of the importance of roles in teams literature. In a very interesting study examining the impact of core role holders on team performance, Humphrey and colleagues used HLM to decipher the importance of certain pitcher and catcher characteristics (career experience, team experience, and job-related skill) on team performance, examining major league baseball team data from 1974 to 2002. The researchers found that those core role holders’ (i.e., pitchers and catchers) career experience and job-related skill related to team performance more strongly than non-core role holders’ characteristics.

Although a major league baseball team might seem quite different from teacher teams, the researchers’ findings are nonetheless thought-provoking and can be applied to PLC composition. Humphrey and colleagues (2009) conclude by suggesting that when managers are making staffing decisions around building or changing teams, prioritizing core roles is important. Similarly, when principals create or change their PLCs (i.e., grade-level teams), attending not only to team personality composition but to what roles certain members might be better suited for within their PLC could yield valuable school improvement.

Certainly, more research is needed to draw firm conclusions about what roles are critical for optimal PLC quality. Bauer, Brazer, Van Lare, and Smith (2013), in their study on teacher teams, found that some team members reported specific roles that members held, particularly the role of team leader. The degree of power that the team leader holds, and whether teams commonly use other roles, is less clear. As Humphrey
and colleagues (2009) note, some roles are more tightly linked to team performance than other roles, so greater clarity around what roles with what job criteria might facilitate PLC quality would be useful. Certain team roles are more central than others and entail greater team responsibilities. Humphrey et al. also acknowledge that depending on the nature of the team, for instance—the level of team member interdependence—the impact of a core role holder will change. In more interdependent PLCs, it is might not be as necessary to have a strong PLC leader whereas in a more disparate PLC with weak member links, a strong PLC leader might especially facilitate PLC quality.

Too often, researchers focus on what PLCs do rather than how they do it. I am guilty of this in my conceptualization of the learning orientation subscale. For example, the PLC Quality surveys asked teachers to respond to the statement, “we often ask each other about classroom management ideas and suggestions” and “our PLC frequently discusses school improvement strategies”. Perhaps these questions are too broad to gain enough information about what issues teachers discuss and make decisions about. Regardless, the result that group members should feel comfortable raising issues and respectfully disagreeing is interesting and deserves a closer look. Some support for this argument exists based on the positive results demonstrated by the current study’s collegiality subscale. Extending that to include items that cover group’s on-task behaviors might expand our understanding of PLC behaviors that relate to teacher effectiveness.

**Distributed leadership.** Agenda items imposed by the principal or district were usually peripheral to effective teaching and not relevant to classroom dilemmas teachers faced. Teachers felt goal-drive PLC meetings—where teachers discuss student learning
objectives and what materials or activities are needed to achieve increased student learning—helped their individual classroom performance.

Interviews with teachers suggest that school structures are important in supporting teacher effectiveness. In particular, schools should focus on establishing enabling structures that enhance collegial communication and support teacher collaboration and innovation (Hoy & Sweetland, 2001). Schools are bureaucracies that have structural features of authority hierarchy, alienation, division of labor, objective standards, technical competence, and rules and regulations (Hoy & Sweetland, 2001). Such bureaucratic structures are unavoidable in large organizations. However, bureaucratic structures need not be rigid and conformity-inducing. They should instead be enacted with an eye towards enhancing teacher job satisfaction, increasing innovation and collaboration (Hoy & Sweetland, 2001).

As Hoy and Sweetland (2001) note, enabling procedures invite dialogue, the ability to learn from mistakes, and allow for addressing the unexpected. In essence, they facilitate problem-solving. On the other hand, coercive procedures are top down, unilateral, and rigid (Hoy & Sweetland). They are designed to monitor and control teachers (Hoy & Sweetland). Viewed through this lens, teachers should be encouraged to structure their own PLC meetings around instructional issues they currently face such as implementing CCSS with fidelity, brainstorming activities and materials to facilitate teaching the new standards, creating common assessments, and analyzing student progress.
Researchers' assertions that distributed leadership has many positive performance outcomes (Wang, Waldman, & Zhang, 2014) support my argument that teachers, rather than administrators, should drive PLC meetings. Ms. Michaels’s point that teachers should have autonomy over PLC meeting agendas and that establishing PLC SMART goals helped keep meetings on-task and tied to student learning is in line with other researchers’ findings on PLC quality. For instance, Bauer and colleagues (2013), in their study of teacher teaming, found that team autonomy and decision-making authority are important conditions to PLC functionality. The researchers also found that successful teams establish team SMART goals and revisit and modify those goals throughout the school year. Goal theory helps to explain the positive relation between SMART goal setting and PLC quality. Goal theory asserts that if people set lofty yet attainable goals, they will be more motivated (Bandura, 1998). Districts could certainly distribute leadership to teachers yet hold them accountable by suggesting PLC goal setting. Goal theory maintains that if teachers engage in goal-setting autonomously, they will be more motivated because they have specific, attainable goals that matter to them. Although there is space for oversight, when teachers set PLC goals and agendas, they will have greater commitment to the outcomes associated with those goals. In addition to positively impacting teaching and learning, PLC autonomy could likely increase teacher buy-in to PLCs.

Research supports that distributed leadership can lead to improved school quality and student learning. Heck and Hallinger (2009) conducted a large, longitudinal study tracking student math achievement in 195 elementary schools in one state over four
years. Their distributed leadership measure was composed of survey items of teachers’ perceptions of leadership, including their role in collaborative decision making and feeling enabled by school administration. The researchers found distributed leadership related to schools’ academic capacity and indirectly to student math growth rates. Heck and Hallinger (2009) conclude that schools should move toward more distributed leadership models.

Similarly, to expand on the discussion of Leithwood and Mascall’s (2008) study initiated in Chapter 2, their examination of the impact of distributed leadership on key teacher variables and on student achievement supports my arguments that distributed leadership might increase PLC quality. The researchers gathered student achievement data for three years from state websites and examined 2,570 teachers’ survey responses from 90 schools. The researchers also studied the relative contribution of different sources of leadership (administration, teacher teams, parents, etc.) and whether these differences related to student achievement differences. In higher achieving schools, teachers attribute more leadership to teacher teams. The highest-performing schools represented a hybrid between autocratic structure (increased influence with hierarchical level) and polyarchic structure (all have high influence). Leithwood and Mascall label this hybrid “intelligent hierarchy,” where organizations take advantage of their members’ strengths while ensuring coordinated efforts in a common direction (p. 553). Leithwood and Mascall found that distributed leadership influences student achievement through teacher motivation and work setting, i.e., distributed leadership indirectly affects student achievement. This is further support for the argument that PLCs should be granted
enough autonomy and decision-making power to be able to make real contributions to curriculum and instruction issues. Principals should facilitate PLCs to ensure all school members are focused on improving school quality, but mandating exactly how each PLC achieves that goal might be too controlling and ultimately detract from school improvement.

**Cohesion and collegiality.** Interview findings raise the possibility that high cohesion may be an antecedent for high collegiality. Overall in the current study, teachers rated their PLCs’ collegiality the highest (5.08 on a 7-point scale), followed by cohesion (4.96 on a 7-point scale) and then learning orientation as the lowest (4.75 on a 7-point scale). However, both interviewees’ PLCs had higher mean cohesion than collegiality, suggesting cohesion might have a role in helping to establish their PLC’s high collegiality. As a matter of fact, of the ten PLCs with the highest collegiality, 80% of those had higher ratings of cohesion. Future experimental or longitudinal research would help flesh out the directionality between cohesion and collegiality.

Mrs. Smith’s discussion of the extremely focused nature of her PLC’s formal meetings, combined with her comments about also spending sizable amounts of time together informally, piqued my curiosity about the connection between team cohesion and collegiality. Although collegiality is predictive of teacher effectiveness in providing students an emotional supportive classroom, cohesion might allow teachers informal opportunities for “gripe sessions” so that when teachers meet formally in PLC meetings, they feel free to focus on instructional issues because they have previously carved out time to socialize. An examination of correlations (Table 12) shows that the highest
correlation among study variables is between cohesion and collegiality ($r = .89, p = .00$). This very significant relation provides support for the idea that high cohesion might enable group socializing at informal times and frees up formal meetings for on-task behavior.

As Goulet, Krentz, and Christiansen (2003) write about collaboration in education, collaborative group members spend much time establishing and maintaining relationships. The authors assert that, “a climate of caring lays the foundation for all collaborative work” (p. 7). Particularly because teachers spend much of their day isolated from colleagues, when they do meet there is undoubtedly some relationship maintenance that occurs. However, the ideal situation is for this maintenance to occur during informal meetings rather than times planned for formal PLC meetings. Certainly, further research into this connection between cohesion and collegiality is warranted. Specifically, statistical techniques that can model directionality, like Structural Equation Modeling, would help flesh out the relationship to determine if indeed cohesion allows for increased collegiality which is then predictive of teacher effectiveness.

Conclusions

The current study is one of the first to my knowledge that couples a widely-used personality measure ($NEO$) with a valid, reliable teacher effectiveness measure ($CLASS$) to study predictors of early childhood educators’ teaching effectiveness. Too often when teacher effectiveness and personality traits are examined in a research study, one or the other variable is measured unreliably or the study population grossly limits generalizability. Because this study illuminates interesting connections between
personality factors, PLC quality and teaching effectiveness, more research should yield fruitful insights into the predictive power of personality traits for educational outcomes. If research is to inform employee selection and assignment, we need to look beyond traditional predictors, especially in the new age of PLCs, when consideration must be given to teachers’ ability to collaborate productively.

Although HLM use for the current study is reasonable and useful, the study’s relatively small sample size restricted power, making the likelihood of finding a statistically significant ICC lower (Bell et al., 2010; Clarke & Wheaton, 2007; LeBreton & Senter, 2008). Therefore, the conclusion that emotional support effectiveness can be attributable to PLC membership is valid but the current study’s null findings for a significant ICC for classroom organization or instructional support does not necessarily mean that teacher effectiveness in these domains is not attributable to PLC membership. Instead, it might be a Type II error, incorrect retention of the null hypothesis, and a function of the current study’s relatively small sample size. Clarke and Wheaton (2007) write that “researchers are probably safer with more data sparseness than they think [and]…may therefore be at risk of increased statistical error when conducting OLS regression with nested data, even if that nesting is sparse” (p. 344-345) but recommend a threshold at which unbiased estimates are more likely: when researchers use at least 100 groups with three observations and no more than 8% singleton groups. Following these guidelines is possible and would undoubtedly yield interesting findings. However, it would also mean a fairly large educational study. Using the same parameters as the current study (K-3 teachers), it would necessitate observations in at least 25 moderately
large schools with high teacher participation to keep singleton PLCs below 10%. Because many schools only have three or four teachers per grade-level, either a very large school district or smaller very similar school districts would have to be sampled from to be able to achieve the optimal sample size described by Clarke and Wheaton (2007). It is heartening that the current study was still able to find statistically significant results with a relatively small sample size. Future research with larger sample sizes in districts implementing PLCs will doubtless prove fruitful and interesting.

Not all hypotheses were confirmed, with the lack of any significant results involving Conscientiousness being the most striking given the factor’s ubiquitous predictive value in other personality—job performance studies. Surprisingly, not only did Conscientiousness not predict any teacher effectiveness domain, it did not even correlate with another study variable. This is unexpected because, in many other occupational fields, Conscientiousness is the strongest predictor of job performance (Harris & Rutledge, 2010; Judge et al., 1999; Ozer & Benet-Martinez, 2006). The current study’s null results are thought-provoking.

One reason for the null finding could be the emotionally laborious aspect of early childhood education. In previous research that finds an association between Conscientiousness and job performance, the occupational fields examined include sales, police officers, and clerical workers, none of which can be argued is an emotionally laborious occupation and which in some ways probably represent more detail-orientation and rule-following than teaching, an incredibly complex occupation requiring not only flexibility and creativity but also sensitivity and positivity to do well. Another reason
might be my choice of the NEO FFI-3. Perhaps one or more of the Conscientiousness facets relate to effective teaching in early childhood settings rather than the entire factor. Further research will help solve this question.

The issue of construct validity—what is meant by teacher collaboration and how it is measured—is of critical importance to interpreting study results. To support teachers in their PLC work and increase teacher effectiveness, we need absolute clarity about what is expected to occur at PLC meetings and reliable, valid measures of that work. The current study’s demonstration of the positive predictive value of PLC collegiality for teacher effectiveness supports the idea that PLCs’ communication quality is an important group attribute that leaders should attend to.

Two results lend credence to the appropriateness and utility of the PLC quality measure: (1) the relation of personality factors to the three PLC quality subscales of cohesion, collegiality, and learning orientation and (2) each subscale’s strong reliability. The fact that collegiality was the main predictor of teacher emotional support effectiveness is important but does not discount the importance of continuing to look at PLC cohesion and learning orientation. Cohesion may be a precursor in some ways to collegiality: high cohesion means PLC members socialize outside of school and during school breaks like lunch and recess times, freeing up formal PLC meetings for collegial interactions around instruction. The directionality of the two variables should be explored in future research.

Likewise, collegiality possibly facilitates PLC learning orientation. Arguably, without collegiality, there cannot be much learning because PLCs meetings would
devolve into conflict or overly conformist group think. In other words, though collegiality is central to PLC quality and relates to teacher effectiveness, it is likely undergirded by cohesion and necessary for group learning orientation.

This study informs current district policy about PLC meeting requirements. Correlations between PLC meeting frequency and PLC quality suggest that more PLC contact time leads to improved PLC quality. Before advocating a more is better approach, it must be kept in mind that the two districts participating in the current study required a relatively small amount of regular, weekly PLC meetings. PUSD required two formal meetings a month while SUSD required one formal meeting a month. In contrast, many northern Virginia school districts structure the school day so that grade-levels have common planning times and therefore require at least two weekly formal PLC meetings. Therefore, it is logical to assume that PLCs in northern Virginia might have higher quality than PLCs in the southern California area studied here because of the increased frequency. However, through my experience teaching in the northern Virginia system and discussions with other K-3 teachers in the area, this is not always the case. I suspect that there is an ideal that lies somewhere between what the districts in this study require and what northern Virginian districts require.

The current study’s results support the potential of high-quality PLCs to increase teacher effectiveness, but it is important to reiterate that during recruitment and data collection, teacher and principal support of PLCs was not universal. One way for PLCs to gain more acceptance among educators would be to incentivize group output. Teaching is still rewarded on an individual basis—individual teachers are recognized as “teacher of
the year” in districts and states across the U.S.. When we also start recognizing “PLC of the year,” we will likely see even greater collaboration and innovation. If we want education to shift from being a largely solitary to a mostly collaborative endeavor, then high-quality collaboration, in addition to high-quality individual teacher effectiveness, should be recognized and rewarded in some way.

This study sought to better understand human behavior while taking into account both individual differences and the individual’s social system. Researchers continue to search for ways to predict human behavior, a notoriously messy endeavor. A theory that accounts for personality and PLC processes in predicting teacher effectiveness would enable us to better control and thus increase school improvement.

**Implications for Practice**

Quantitative results showing that PLC collegiality predicts teacher effectiveness in emotional support provides credence to the spread of PLCs. PLC collegiality predicted teacher emotional support effectiveness, raising the question of how schools might foster collegiality; turning to variables related to the subscale provides clues.

Study results related to PLC collegiality allow for suggestions about how to cultivate it. In the current study, PLC collegiality is correlated with: (1) individual teacher Agreeableness, (2) PLC cohesion, and (3) informal and formal meeting frequency. Suggestions for administrators include hiring teachers who are in the average range in Agreeableness. Because Agreeableness correlates positively with collegiality and cohesion, teachers with low Agreeableness would probably not be a good fit in many PLCs. However, it has to be kept in mind that PLC mean Agreeableness negatively
predicted teachers’ emotional support effectiveness, so individuals very high in Agreeableness should likely not be hired. Instead, hiring teachers in the average to high range would probably behoove school improvement efforts.

With knowledge about personality predictors of teacher effectiveness, administrators can make more informed decisions about how to structure their school’s grade-level teams—for instance, PLCs with highly agreeable members are less effective in providing students with emotional support, suggesting that more diversity in this personality factor within PLCs might be helpful to teacher effectiveness. Enabling structures like school scheduling should improve PLC quality and ultimately, school quality. This study’s results around teacher decision-making align with national initiatives to increase teacher leadership—when teachers demonstrate leadership around PLC meeting agendas and goals, teacher effectiveness is likely to increase. In this section, the implications mentioned here will be elaborated upon.

**Hiring and Assignment**

Some theorists offer that too much Agreeableness can impair team creativity because of the lack of critical and challenging communication (Bradley et al., 2013). However, other scholars assert that at least baseline levels of Agreeableness are necessary for teams not to devolve into conflict (Bradley et al., 2013). I agree with both points and hold that there is probably some happy medium level of group Agreeableness that allows for both high collegiality and teacher effectiveness. Groups with too many highly agreeable teachers likely do not challenge each other enough, but it must be kept in mind that PLC mean Agreeableness positively predicts cohesion and individual Agreeableness.
positively relates to collegiality. As Bradley and colleagues (2013) conclude, “managers must find an effective balance between enough agreeableness, harmony, and social integration on the one side and conflict, debate, and constructive criticism on the other” (p. 702). Again, professional development around functional, productive communication might help both teachers low in agreeableness with conflict resolution as well as teachers high in agreeableness with being more assertive and not conforming to other teachers' opinions too quickly.

Teachers with average levels of Agreeableness might be more likely to contribute to creating collegial PLCs. When hiring, it is probably best for principals to avoid teachers very high or very low levels in Agreeableness. Instead, average to slightly high levels of Agreeableness might be optimal for building PLC collegiality and teacher effectiveness. Additionally, when assigning teachers to grade-levels—a leadership decision elementary principals have more control over than secondary principals because many elementary teachers have teaching licenses that allow them to teach multiple grades—principals should keep in mind their teachers’ Agreeableness. It will likely behoove school improvement efforts for principals to build PLCs with an eye toward increasing collegiality and teacher effectiveness by keeping PLC mean Agreeableness levels in the average range.

**PLC Quality**

As many will concede, defining what collegial relationships look like and how to support them is not easy (Ayo & Fraser, 2008). Assuming that PLCs do not need to be facilitated is certainly short-sighted. Merely requiring teachers to meet regularly as a
means to increase teacher effectiveness is insufficient. The current study finds that PLC collegiality—effective communication, ability to disagree respectfully, openness to listening to members’ ideas—predicts teacher effectiveness in providing emotional support to students. The directionality is probably that collegiality could lead to effectiveness, but experimental and longitudinal data is needed to clarify the variables’ relation. In an attempt to determine whether some construct is responsible for both collegiality and teacher effectiveness, personality was examined and individual personality traits were entered in the HLM conditional model at Level 1, with the PLC Quality variables at Level 2. No personality variable was significant. This null result could suggest one of three things, that: (1) collegiality might indeed influence teacher effectiveness, (2) some construct other than personality causes teachers to be collegial PLC members and effective teachers, or (3) the current study’s sample size is simply too small to identify a personality factor responsible for the PLC collegiality-teacher effectiveness connection. Teachers’ openness to sharing ideas and engaging in constructive disagreements undoubtedly allows for better exchange of ideas and personal growth, but this does not come naturally to groups. Indeed, school leaders should consider facilitating PLC interactions to foster teacher effectiveness.

When groups experience stress and cannot handle it collegially, it reduces their capacity for creative problem solving. Therefore, professional development on how to establish supportive, empowering group experiences should have positive employee outcomes (Leiter, Laschinger, Day & Oore, 2011). Effective intervention should include two aspects: (1) training on how to handle negative exchanges, and (2), training on how
to promote positive exchanges and build group good will (Leiter, Laschinger, Day & Oore, 2011). Leiter et al. (2011) examined the effectiveness of an organizational intervention aimed at improving employee outcomes like the quality of social relationships, burnout, and job satisfaction. The research followed a quasi-experimental design involving 41 units in a hospital, eight of which were selected to participate in a six-month CREW intervention designed to increase civility among employees. Groups met weekly or biweekly and participated in exercises that included practice in active listening, settling disputes, conflict resolution, and brainstorming. Over 1,000 health care workers participated. Measurements were taken at two time-points to gauge incivility, respect, trust in management, burnout, turnover intention, efficacy, organizational commitment, job satisfaction, and absenteeism. Four hundred seventy-two employees completed the survey at both time points. HLM analyses showed positive impacts of the CREW intervention: improvements on measures of civility, burnout, job attitudes, management trust, and absences. Interventions like CREW have the potential to increase teachers PLC quality through its focus on improving the social behavior of group members leading to better conflict resolution and collegial discussions (http://cord.acadiau.ca/crew-interventions.html).

The connection between collegiality and teachers’ emotional support effectiveness is important and supports national reform efforts around PLC implementation. Teachers who score in the high range in emotional support structure their classroom activities with regard to student perspectives—emphasizing student-focused instructional formats versus teacher-directed ones. Teachers who establish
emotionally supportive classrooms encourage group work, student expression, and a positive climate. These are aspects that are mirrored in collegial PLCs. It is logical to assume that given the current trends in education policy—CCSS and encouraging PLCs—this connection will exist and even spread. Whereas before the implementation of the CCSS, teaching with an eye towards establishing collaborative classroom environments might not have been as common as some would like, with the new standards comes an emphasis on group problem-solving and problem-based learning that aligns well with the CLASS and with what we expect of teachers in PLC meetings. The implication for practice is one that might play out naturally as teachers progress through professional development centered on implementing the CCSS and participating in PLCs. In the modern era of dense communication and connection between people, the fact that schools are becoming places that are increasingly structured in a group-oriented format bodes well for continued school improvement and the connection between school and 21st century skills needed for student success.

**Enabling Conditions**

Recommendations for increasing PLC collegiality include forming PLCs with attention to group members’ personalities, structuring the school day to allow teachers common informal time (lunch, recess, planning) when they might choose to meet to build camaraderie and socialize. Likewise, schools should schedule adequate formal meeting time for PLCs (probably about 50-75 min weekly). School scheduling and structures are undoubtedly a key component of supporting high quality PLCs that will encourage effective teaching.
Hackman (2012) makes an important point that organizations need to stop emphasizing group interventions and focus on establishing enabling conditions under which groups are most likely to succeed. There is certainly a place for professional development and group interventions for PLCs. But too often, these workshops are cookie-cutter occurrences that can waste teacher time. As Hackman writes, “what could help an experienced, competent group develop a plan of action, for example, will be quite different from what would be recommended for a group of novices that is just getting started” (p. 433). This gets to the heart of the matter when it comes to the need for administrators to facilitate rather than control PLC meetings. Some PLCs probably do not need much help from administration at all in focusing on important topics during PLC meetings that help the members teach better. However, there are probably many more PLCs that do need assistance but need different forms of assistance. The best plan for administrators is to establish enabling conditions in schools for PLCs to succeed and then to monitor how PLCs function to ensure school improvement.

Enabling school structures are a form of enabling conditions, and a number of recommendations exist for setting these up to improve PLC quality and teacher effectiveness. One example of an enabling school structure would be school scheduling that allows teachers adequate—but not excessive—informal and formal time together. The two teachers interviewed for this study asserted that PLC time was inordinately spent on instructional discussions, not mere socialization. The teacher whose PLCs met once a week because of how her principal structured the school day felt that it was the right amount of time. In contrast, the teacher whose PLC met every other week thought weekly
meetings (which she had experienced at a previous school where she worked) would be ideal. Both teachers thought twice-a-week meetings would not be necessary. I suspect that when teachers have too little time together, they do not have adequate discussion time to set goals and analyze student data and make adjustments to curriculum and instruction. However, too much time together might contribute to a situation where it is taken for granted that there is much time for discussion. This could lead to meetings that are less-focused and include more socialization. Altering school structures to enable sufficient formal PLC interaction, perhaps an hour a week, as well as time for informal interaction (e.g., shared lunch times), will likely help improve not only PLC quality but teacher effectiveness as well.

Another example of an enabling structure that would likely support teacher effectiveness is a rule that teachers use professional judgment to create PLC meeting agendas. Interviews with teachers suggest that PLC meetings are most supportive of teacher effectiveness when that collaboration time is spent on significant instructional issues that grade-level members currently face. PLC meeting agendas should be organic, living documents that vary week to week according to what PLC members need to problem-solve that week. PLC meeting agendas and discussion items should not be mandated in a top-down fashion from administration, which leaves teachers little time to analyze their PLC’s progress towards their grade-level’s goals.

Teachers should not be required to spend PLC time addressing administration’s general questions about instruction and curriculum, the answer to which might not transfer to curriculum and instructional change and improvement. As the U.S.
Department of Education (2013) writes in its blueprint for 21st century teaching, school structures should provide teachers with time to collaborate to solve learning challenges their students face and given the autonomy professionals need to do their jobs effectively. Districts and principals must structure or schools to include enabling procedures that maximize teacher productivity and problem-solving.

**Distributed Leadership**

Similar to the idea of establishing enabling structures in schools that foster teacher collaboration and autonomy, distributed leadership and shared decision-making should be enacted for school improvement. Vera and Crossan (2004) state that the ideal leader should share leadership with colleagues. This point is especially applicable to school contexts and supports because of the constant organizational learning required and it is doubtless achieved better when teachers are responsible for their own goal-setting. Both teachers interviewed were very fond of their principals and viewed them as competent, thoughtful leaders who valued teacher professionalism. Both Mr. Smith and Ms. Michaels stressed that PLCs be allowed flexibility in how they spend PLC meetings. We do not want schools to become highly centralized structures with directives from superiors requiring arbitrary rules be followed without question because this structure tends to guarantee compliance at the expense of innovation.

The need for increased distributed leadership in schools is recognized by the U.S. Department of Education (2013). For the past few years, the department has made collaborative labor-management relationships part of its major grant programs including Race to the Top, the Teacher Incentive Fund, and ESEA flexibility. One of the seven key
areas of reform the department encourages states and districts to implement is to create schools to have a culture of shared responsibility and leadership. This includes creating decision-making structures that empower teachers to develop goals and strategies for achieving those goals. The department states that schools should organize their faculties into "teams committed to meeting specific ambitious academic goals" (p. 16). There is certainly a role for the principal in PLCs, but it should be to ensure that each PLC's goals are ambitious and aligned with new CCSS. Otherwise, the main responsibility for instructional decisions aimed at raising student achievement should fall to teachers.

Limitations

Study limitations include measures, sampling, and validity concerns. Some subscales of the PLC quality survey, such as faculty collegiality, are not clearly delineated in previous research, with the construct often being vaguely defined (Cipriano & Buller, 2012; Shah, 2012). Because of this, there is not a trove of measures from which to choose when attempting to operationalize and measure collegiality (Shah, 2011). I therefore compiled a measure of PLC quality from modifying similar measures’ instruments to better fit the elementary PLC context. The experimental nature of the PLC quality measure is a study limitation because although a similar measure was pilot tested and an expert review panel provided feedback on the measure, this will be the first study using the measure.

Recruitment was a limitation. When principals allowed me to come to their school and quickly (about 5-10 minutes) meet with teachers during PLC meeting times to recruit, more teachers participated. During the PLC meeting times, teachers were in an
intimate setting where they were comfortable to ask questions about the study. Recruiting at faculty meetings was not quite as successful and fewer teachers asked questions, probably because they were eager for the faculty meeting to end so they could return to their classrooms and also because the principal was in attendance. When principals preferred to merely forward my email to teachers rather than allowing me to come and directly speak to teachers, few teachers participated. Recruitment strategy therefore greatly affected my sample size.

The sample might be skewed towards more effective teachers who are confident in their teaching and willing for observers to watch them. This might skew my data towards having more effective teachers and not make my conclusions as generalizable as I would like.

Sample size is another limitation. Fifty-seven teachers participated, and some HLM analyses were significant, but the number of groups and the presence of singletons limited statistical power. The presence of many singleton groups made any attempts at explaining variance in conditional models unwise, which limits inferences that may be drawn from the study results. The small sample size also made the likelihood of finding a statistically significant ICC lower, which limits the discussion about teacher effectiveness in providing classroom organization and instructional support. Because the sample size was relatively small, the fact that a statistically significant ICC was not found for these two teacher effectiveness domains does not necessarily mean PLC membership does not influence these teacher domains. Further studies that include more teachers and PLCs would help explain the impact of personality and PLC quality on teacher effectiveness.
Another possible limitation is the use of the NEO FFI-3 rather than the NEO PI-R. Although research supports the use of factors alone in job performance prediction, some research nonetheless found facets more useful than factors in predicting job performance. Some NEO PI-R facets might align more closely to the CLASS and be more predictive of teacher effectiveness than overall factors. This might be one reason for the lack of findings regarding the Conscientiousness factor or the classroom organization domain. The decision to use the NEO FFI-3 was made for two reasons. First, it is much shorter than the NEO PI-R, requiring approximately one third the time to complete. Most teachers are overly taxed for time as it is, so choosing shorter measures might increase teacher participation. Second, it is more practical from a data analysis perspective to analyze five factors alone rather than the factors and thirty facets.

A fundamental validity threat for my qualitative data collection is that observations and interviews are highly reactive situations. Because I have taught 1st and 2nd grades, playing the naïve researcher will not work, particularly because I informed participants during recruitment of my status as a teacher in hopes of increasing participation. However, with current reform demands from researchers and educators, teachers can be leery of speaking with strangers, even fellow teachers, about educational issues. Judgment is rampant. Teachers providing answers they think might be acceptable to a fellow teacher and PhD candidate is a concern, one I will have to be prepared for and try to alleviate through establishing rapport.

One source of validity concern is inference validity about teacher effectiveness comparison. I observed 54 teachers in three months. Because of the need to observe as
many teachers as possible while accommodating teachers’ schedules and comfort, I could not observe all teachers during the same subject area, leading to possible validity concern about comparing teacher effectiveness across different instructional periods. Because I am observing early childhood educators, whose teacher preparation courses often focus heavily on literacy instruction, many teachers might be more comfortable teaching language arts. Therefore observing all teachers during language arts instruction might be the safest option when it comes to drawing comparisons, it is not practical for data collection purposes. This is a possible source of error.

**Recommendations for Future Research**

This is one of few education research studies that studied personality traits, PLC quality, and teacher effectiveness in depth, and results suggest further educational psychology research studies that include personality as a predictor could yield germane results. As has become quite clear, further research on the FFM and teacher effectiveness is needed. This is only the second elementary education research study to my knowledge that employed the *NEO FFI-3* (the first in 2008 being Decker and Rimm-Kaufman’s study of pre-service teachers’ attributes), but the first to examine its predictive ability in relation to teacher effectiveness. Extending this research will doubtless inform teacher selection and assignment. Although knowledge about which factors relate to teaching is useful, further research using the *NEO PI-R*, which is quite a bit longer but includes facet scores, would be helpful. Using the FFM’s facets greatly improves accuracy in prediction (Ozer & Benet-Martinez, 2006).
In future research, examining not only a group’s mean personality scores but the variance in scores, i.e., how closely PLC members resemble each other, will add detail to how group personality composition affects PLC quality and teacher effectiveness. The current study found interesting results for the importance of group mean personality, but how helpful or not it is for group members to closely resemble each other would also inform teacher assignment decisions.

A major strength of the current study is the inclusion of a research-based observation tool. Most research on the relation between personality and teaching, and even PLC quality and teaching, do not include classroom observations of teacher effectiveness as an outcome. Although observing teachers using the CLASS is expensive in terms of training and certification costs as well as time needed for the observation, such teacher observations provide valuable, detailed data. Research on the reliability and validity of using classroom observations of teachers as a measure of teacher effectiveness continues to grow (Bill and Melinda Gates Foundation, 2013). Considering the national education policy emphasis on teacher effectiveness and PLC implementation, this research approach should be used more frequently to yield more information about what aspects of PLCs should be supported in order to increase teacher effectiveness. Aligning data gleaned from classroom observation tools with high-quality standardized assessments would be another area of research that could yield valuable information about the value of predicting student academic achievement from teachers’ classroom behaviors.
The personality measure used for this study, the *NEO FFI-3*, provides scores on the five factors, but using the multi-faceted *NEO PI-R* would yield much more detailed (and therefore likely more useful) data regarding teacher personality predictors of effectiveness. The curvilinear relation between Extraversion and teacher effectiveness in providing instructional support can be supported with the available literature. However, the HLM results regarding mean PLC agreeableness and teacher effectiveness in providing emotional support are less commonsensical. The *NEO PI-R* provides facet scores which would certainly clarify why those two personality factors might be related negatively to teacher effectiveness. In considering the negative relation between group-level Agreeableness and teacher effectiveness, it can be surmised that teachers who scored high Agreeableness score might have done so because of high facet scores in compliance, tender-mindedness, and trust (the remaining three facets being straightforwardness, altruism, and modesty). High compliance could produce overly acquiescent group dynamics where teachers too quickly fall into group think, scrutinizing assumptions and generalizations insufficiently. Although trust is often identified as a positive variable in education leadership literature, in the context of a personality trait exerting influence in a group setting where members must come to analyze and problem-solve, groups who are too trusting might not hold each other to high enough standards. Because personality factors related to teacher effectiveness in some surprising ways, delving into more detail will offer greater explanatory power.

Qualitative findings point to enabling school conditions and distributed leadership as possible explanations for the connection between PLC collegiality and teacher
emotional support effectiveness. Literature on enabling school structures and distributed leadership align with the current study’s quantitative and qualitative findings in that much support exists for the positive effects of both. Further studies that examine these conclusions, specifically identifying what school structures are enabling (e.g., PLC meeting frequency, shared breaks, etc.) for PLC quality and teacher effectiveness would help clarify recommendations about how to implements PLCs. These should also include measurement of the school’s decision-making structures to gauge how distributed it is and whether teachers have autonomy over PLCs meetings, scheduling, curriculum and instruction.

Another avenue for future research is the impact of PLC member roles to PLC quality and teacher effectiveness. One can predict that a PLC might perform better—be more collegial and increase teacher effectiveness—under the leadership of a certain type of teacher. But the unanswered question is what type of teacher might be best for this role: a very experienced, agreeable teacher who can keep other members’ morale high, an energetic young teacher who pushes members to be creative and try new approaches, the most effective classroom teacher, regardless of her personality traits, etc. Given previous team research that core team roles can have differential impact on team performance, more research about PLC roles and teacher effectiveness would be valuable.

Further research using larger data sets and more sophisticated statistical analyses would help answer questions raised by the current study. First, what is the optimal PLC meeting frequency for fostering PLC quality and teacher effectiveness? The idea that a PLC’s informal meeting time allows for socializing and increased cohesion might free up
teachers to collegially focus on instructional issues during formal meetings is a thought-provoking one. If PLCs are cohesive, they spend informal time together. Cohesive PLCs likely come to PLC meetings already apprised of their fellow members’ thoughts and feelings and do not have to tend to the social relationship before getting to work on instructional issues. Further exploration of this possibility would help clarify what sort of PLC member relationships and school schedules might allow for uninterrupted instructional discussions. Larger data sets with analyses that include SEM should provide better opportunities to examine whether this situation occurs in high-quality PLCs.

Second, larger data sets would help answer how to modify the PLC Quality survey. It seems the collegiality scale does not need modification, but adding some items to cover task orientation and conducting a similar study on a large scale would answer whether the cohesion and learning orientation subscales are predictive of teacher effectiveness.

As mentioned above, Anderson and West’s (1998) conceptualization of task orientation might have utility when measuring PLCs. I recommend using some items from their Team Climate Inventory measure that factor analysis showed load onto the task orientation variable. For example, “do you and your colleagues monitor each other so as to maintain a higher standard of work,” “does the team have clear criteria which members try to meet in order to achieve excellence as a team” (p. 247). Including measures of task orientation—focus on collaboration quality (focused attention on task, effective and timely redirections when necessary, etc.) rather than focusing on what
teachers are collaborating about (student data analysis, lesson planning, etc.) might be more important for predicting which PLCs foster their members’ effectiveness.

In a similar vein, mixed-methods studies will doubtless illuminate possible processes supporting the connection between PLC attributes and effective teaching. Indeed, it was through interviewing that I was able to hone my explanations for the connection between PLCs and teacher effectiveness and that other question were raised. Combining methods when possible, even if it is to a limited degree, is more useful than using one method alone, especially for answering questions about the connection between individual differences and group behaviors.

A similar study to this one, using mixed methods with a team of researchers would undoubtedly yield excellent data. Even one or two more CLASS observers and two researchers well-versed and very familiar in qualitative research would have fleshed out this study's variables. For instance, in the approximately 4.5 months during which I completed 54 observations, with two other researchers we might have been able to complete at least double and closer to triple that amount, greatly increasing statistical power. Similarly, if at least two researchers conducted interviews and were able to additionally observe PLC meetings to examine how collegiality manifests itself during group interactions as opposed to relying solely on teacher reports of PLC collegiality, greater understanding of processes underlying the association between variables would occur. Studying teacher effectiveness, the predictive power of personality to the construct, and what high-quality PLCs entail, is an exciting research area well-timed to current national education policy. Given that we continue to be in a national state of
educational reform efforts, the connection between personality traits and individual and organizational change should be examined further.

**Final Thoughts**

In light of the current study’s findings, closer examination of some popular PLC recommendations is warranted. Many administrators are familiar with the DuFours’ writings about PLCs, which often call for teachers to engage in particular PLC behaviors. For instance, DuFour (2004) specifically states that in PLC meetings, teachers should: plan instruction and assessment, analyze how all students in the grade-level performed on those assessments, address areas for student remediation. These actions can be viewed as a cyclical process that sounds logical and quite commonsensical. However, in my experience as an educator and as a result of undertaking the current study and its pilot study, it has become clear that some administrators take DuFour’s recommendations as a prescription that must be spoon-fed to teachers. Some teachers are therefore given detailed PLC meeting agendas and asked to focus on certain steps along the cyclical process described by DuFour that might not align well with current classroom issues teachers face. For instance, if administration calls on teachers to plan math assessments in one month when teachers already have strong common math assessments but instead need the time to plan hands-on lessons, PLC meetings become moot and trigger teacher hostility and resentment. If teachers are asked to perform tasks during PLC meetings that do not address the classroom needs they currently face, the aim of PLCs is undermined.

As Hargreaves and Dawe (1990) pointed out nearly 25 years ago, teacher collaboration should surely be facilitated by administrators, but the potential for
professional development and school improvement is substantially reduced if administration instead strictly supervises and intrusively controls PLC meetings. There is doubtless a delicate balance that administrators must walk—and teachers must advocate for—so that PLC meetings are focused, organic arenas for collaboration that tackle teaching and learning issues in a timely manner.

To reiterate, PLCs should be regarded as a means to an end, not an end in itself, and close attention must be paid to how PLCs are implemented and the goal that they are to achieve. PLCs can be composed with an eye toward ensuring that members’ personalities set up enabling conditions of cooperation and critique of current practices to ensure teacher practice is constantly assessed and adjusted to meet students’ needs. PLCs should be breeding grounds for instructional creativity and problem-solving, not mechanisms through which administrators enforce external requirements. Although PLCs are certainly social systems that must react to the larger environment, this can be accomplished while maintaining PLC meetings as professional development opportunities that serve both individual member effectiveness and school quality more broadly.
TO: Anastasia Kitsantas, College of Education and Human Development
FROM: Aurali Dade
        Assistant Vice President, Research Compliance
PROTOCOL NO.: 8614
PROPOSAL NO.: N/A
TITLE: The Role of Personality and Professional Learning Community Quality in Predicting Teacher Effectiveness
DATE: October 10, 2013
Cc: Nicole Jones

Under George Mason University (GMU) procedures, the amendment submitted on October 2, 2013 to this protocol does not change the status of the project. This project remains exempt since it falls under DHHS Exempt Category 1, research conducted in an educational setting that will assess the effectiveness of educational materials and practices and DHHS Exempt Category 2, research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior.

You may proceed with data collection. Please note that any further modifications to your protocol must be submitted to the Office of Research Integrity & Assurance (ORIA) for review and approval prior to implementation. Any adverse events or unanticipated problems involving risks to subjects including problems with confidentiality of data identifying the participants must be reported to the GMU ORIA.

GMU is bound by the ethical principles and guidelines for the protection of human subjects in research contained in The Belmont Report. Even though your data collection procedures are exempt from review by the GMU IRB, GMU expects you to conduct your research according to the professional standards in your discipline and the ethical guidelines mandated by federal regulations.

Thank you for cooperating with the University by submitting this protocol for review. Please call me at 703-993-5381 if you have any questions.
APPENDIX B

Note. The study concept map conveys that teacher personality directly affects teacher effectiveness, but that in schools where teachers participate regularly in PLCs, personality also affects PLC quality which in turn influences teacher effectiveness. For PLC quality, the separate box for principal support acknowledges that principal support behaviors influence teachers individually, other principals behaviors that relate to supporting and buffering PLC work is an integral component of PLC quality.
APPENDIX C

Teacher Demographics Survey

Please complete the following information:

**General Information**

1. **What grade-level do you currently teach?**
   
   | ____kindergarten | ____1st grade | ____2nd grade | ____3rd grade |

2. **What is your gender?**
   
   | ____Male | ____Female |

3. **What is your current marital status?**
   
   | ____married | ____widowed | ____separated | ____divorced | ____never married | ____living with a partner in a marriage-like relationship |

4. **Are you of Hispanic or Latino origin?**
   
   Yes _______ No ____________

5. **What is your race?**
   
   | ____White | ____Black or African American | ____Asian | ____Native Hawaiian or Other Pacific Islander | ____American Indian or Alaska Native |

6. **In what year were you born?**
   
   ________

7. **Excluding time spent on maternity/paternity leave or sabbatical, how many school years have you worked as an elementary- or secondary-level teacher in**
public, public charter or private schools? (Please include the current school year and do NOT include time spent as a student or substitute teacher)

8. How many years have you worked at THIS school as a regular full-time teacher? (Please include the current school year and do NOT include time spent as a student or substitute teacher)

9. Which category best describes your education step:

<table>
<thead>
<tr>
<th></th>
<th>BA/BS</th>
<th>BA/BS + 15 credits</th>
<th>MS/MA</th>
<th>MS/MA + 30 credits</th>
<th>Doctorate</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Class Organization

10. How many of the students you teach have an Individualized Education Program (IEP)?

11. How many of the students you teach are English-language learners (ELLs)?

12. How many students are currently enrolled in your class?

Education and Training

13. In what year did you receive your bachelor’s degree?

14. What was your major?

15. Do you have a master’s degree?

___ Yes ___ No

16. In what year did you receive your master’s degree?

17. What was your major?

Professional Development
18. In the past 12 months, did you participate in any of the following professional development activities? (Please check all that apply.)

- University course(s) related to teaching
- Observational visits to other schools
- Workshops, conferences, or training sessions in which you were a presenter
- Other workshops, conferences, or training sessions in which you were NOT a presenter

19. What was the focus of the professional development activity?

20. Overall, how useful were these activities for you?

- not useful
- somewhat useful
- useful
- very useful

Certification

21. Which of the following describes the teaching certificate you currently hold that certifies you to teach in THIS state?

- Full license. Certificate issued to persons who must complete a certification program in order to continue teaching
- Provisional license. Certificate issued after satisfying all requirements except the completion of a probationary period
- Emergency license. Certificate that requires some additional coursework, student teaching, or passage of a test before regular certification can be obtained
- I do not hold any of the above certifications in THIS state

22. Are you certified by the National Board for Professional Teaching Standards in at least one content area?

- Yes
- No

Teacher Attitudes

23. If you could go back to your college days and start over again, would you become a teacher or not?
Certainly would become a teacher
Probably would become a teacher
About even for and against
Probably would not become a teacher
Certainly would not become a teacher

24. **How long do you plan to remain in teaching?**

<table>
<thead>
<tr>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>As long as I am able</td>
</tr>
<tr>
<td>Until I am eligible for retirement benefits from this job</td>
</tr>
<tr>
<td>Until I am eligible for retirement benefits from a previous job</td>
</tr>
<tr>
<td>Until I am eligible for Social Security benefits</td>
</tr>
<tr>
<td>Until a specific life event occurs (e.g., parenthood, marriage)</td>
</tr>
<tr>
<td>Until a more desirable job opportunity comes along</td>
</tr>
<tr>
<td>Definitely plan to leave as soon as I can</td>
</tr>
<tr>
<td>Undecided at this time</td>
</tr>
</tbody>
</table>

25. **How often does administration require you formally meet in your PLC/grade-level team?**

26. **How often do you meet formally (at a time specifically scheduled for grade-level team meetings) to discuss instructional issues?**

<table>
<thead>
<tr>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
</tr>
<tr>
<td>Sometimes</td>
</tr>
<tr>
<td>Seldom</td>
</tr>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

27. **How often do you meet informally (before or after school, during lunch or breaks, etc.) with colleagues to discuss instructional issues?**

<table>
<thead>
<tr>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
</tr>
<tr>
<td>Sometimes</td>
</tr>
<tr>
<td>Seldom</td>
</tr>
<tr>
<td>Never</td>
</tr>
</tbody>
</table>

28. **Approximately how many minutes a week are spent meeting, either formally or informally, with PLC members to discuss instructional issues?**

29. **For how many years have you been a part of your current PLC?**
APPENDIX D

Professional Learning Communities Survey

1. I learn new skills and knowledge from collaborating with my PLC members.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

2. The principal does not prevent outside demands from “overloading” our PLC with too many requests.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

3. Our PLC encourages openness to change.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

4. There is arguing among PLC members.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

5. Instructional experimentation and change are not important to our PLC.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

6. PLC members are open to listening to each other’s new ideas.  
   ___strongly disagree  ___disagree  ___somewhat disagree  ___neither agree nor disagree  ___somewhat agree  ___agree  ___strongly agree

7. What I learn in my PLC improves my teaching.
8. In our PLC, we generate new ideas about teaching and learning.

9. We receive ongoing training when new initiatives are launched.

10. PLC members like each other.

11. If a conflict arises in our PLC, the people involved take steps to resolve the conflict immediately.

12. PLC members invite each other to visit them at home.

13. The principal provides time and resources for our PLC to reflect and improve on past performance.

14. I change my instruction on the basis of feedback from PLC members.

15. Teachers have fun socializing together during school time.

16. In PLC meetings, we evaluate student academic achievement.

17. I look forward to coming to PLC meetings.

18. Our PLC frequently discusses school improvement strategies.

19. We regularly observe one another teaching as a part of sharing and improving instructional strategies.
20. I feel included in my PLC.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

21. In our PLC, we often ask for suggestions to specific discipline problems.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

22. Compared to other PLCs, our PLC is better than most.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

23. I want to remain a member of this PLC.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

24. Our PLC systematically collects student data to assess our teaching success.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

25. Most teachers in this PLC contribute actively to making decisions about curriculum.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

26. PLC meetings are useless.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

27. In our PLC, members participate actively in meetings.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

28. Even when PLC members disagree, we communicate respect for each other.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

29. PLC members often teach each other informally.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

30. We often share journal articles and educational books.
__strongly disagree  __disagree  __somewhat disagree  __neither agree nor disagree  __somewhat agree  __agree  __strongly agree

31. When making decisions, our PLC works to reach a consensus.
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 32. PLC members are afraid to say what is on their minds. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 33. PLC members share responsibilities. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 34. The principal meets with our PLC regularly to discuss our work and goals. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 35. It is easy to communicate with other PLC members. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 36. I believe it to be beneficial for my teaching to be open with colleagues about my successes and challenges. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 37. Our PLC jointly plans and prepares teaching strategies and procedures. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 38. Overly emotional displays (i.e., crying, yelling) are expected in my PLC. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 39. We often ask each other about classroom management ideas and suggestions. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 40. In my PLC, time constraints get in the way of having productive meetings. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 41. In spite of individual differences, a feeling of unity exists in my PLC. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 42. Our PLC works together to modify subject matter for students. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 43. Our PLC never pays attention to different views during discussions. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
44. In our PLC, we evaluate our instructional practice.

45. When the principal says he/she will do something, I know it will happen.

46. PLC members provide strong social support for each other.

47. PLC members are usually comfortable talking about problems and disagreements.

48. We enjoy working in PLCs.

49. Our PLC changes instruction on the basis of student data analysis.
APPENDIX E

1. What does effective teaching look like?

   a) How would you describe an emotionally supportive classroom?

2. What helps you to be an effective teacher?

   a) What helps you to be emotionally supportive to students?

3. Does your PLC share a vision of effective teaching?

   a) What about a vision of an emotionally supportive classroom?

4. How can PLCs help teachers be more effective?

5. What are teachers’ expectations of PLC members?

6. What are teachers’ expectations of PLC meetings?
7. When you meet with your PLC, what kinds of things do you discuss?

8. How does your school/PUSD structure PLCs?

9. How does your PLC influence your classroom performance?
   
a) Probe for examples…

10. Are there any questions I should have asked?

11. Is there anything else you would like to share with me on this topic?
REFERENCES


Bauer, S. C., Brazer, S. D., Van Lare, M., & Smith, R. G. (2013). Organizational design in support of professional learning communities in one district. In S. Conley & B. S. Cooper (Eds.), Moving from teacher isolation to collaboration (pp. 49-80). Lanham, MD: Rowman & Littlefield Education.


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Nicole Morgan Jones was born in South Africa and lived on five continents as the daughter of an American diplomat. Her multicultural experience shaped her graduate studies and her focus on the importance of achieving high quality education for all students, independent of background or SES. She graduated from Northfield Mount Hermon School in Massachusetts in 1998. She received her Bachelor of Arts from Temple University Tokyo Campus in 2005, and her Master of Arts in Teaching from the University of California, Irvine. She worked as an elementary teacher for Prince William County School District in Virginia and as an adjunct professor at George Mason University. She currently lives with her husband, daughter, and cat in California.