USING A PROFESSIONAL LEARNING COMMUNITY TO DESIGN PROFESSIONAL DEVELOPMENT

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There has been an increase in accessibility to computers in K-12 education across the United Sates (Molnar, 2015). In addition, technology has become more sophisticated and is having a substantial impact on the manner in which instruction is delivered to students in the classroom and the manner in which students are assessed (Zhang, Zhao, Zhou, & Nunamaker, 2004). Subsequently school districts are responding by providing teachers with professional development activities that build their capacity to effectively use technology in the classroom. Quality professional development activities must collaboratively engage teachers in sustained and reflective exercises that are connected with each other and deeply established in inquiry (Darling-Hammond & McLaughlin, 1995). To create this environment, school leaders must engage their staff in job embedded activities that develop strategies relevant to the profession.

Traditional forms of professional development, however, are often criticized for presenting isolated topics to large groups of teachers with little to no follow through or continued support (Kohler, Crilley, Shearer, & Good, 1997). In addition, these forms of professional

development rarely solicit the input from teachers and occur infrequently throughout the school year. Due to the lack of coherence, many professional development sessions fail to impact the manner in which curricula are delivered to students in the classroom (Showers & Joyce, 1996) and generally have no impact on improving the quality of instruction (Harris & Sass, 2011).

This study provides professional development through the incorporation of a Professional Learning Community (PLC) with a small purposeful sample of high school teachers who have been identified as high-level technology users. PLCs have emerged as a reliable means of building the capacity of teachers and can have a positive impact on student achievement in the classroom (Louis, Marks, & Kruse, 1994). This study builds upon the current research related to PLCs and examines how a PLC can be used for learning and planning. Specifically, due to the proliferation of technology, the PLC reflected upon their current practice and designed professional development activities for their colleagues.

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1.0 INTRODUCTION

In the United States accessibility to computers in K-12 education has increased (Molnar, 2015). In 1983, it was estimated that 50,000 computers were available for student use in K-12 classrooms, which translated to a student to computer ratio of 125:1 (Becker, 1990). That ratio decreased significantly when the number of computers available to students increased to 2.6 million by the end of the decade, however there was limited usage in the classroom to support instruction (Becker, 1990). By 1995 the ratio of students to computers was 9:1 and more teachers identified themselves as serious users (U.S. Congress Office of Technology Assessment, 1995).

To increase the integration of instruction with technology, 83% of school districts with Internet access offered staff development sessions to their teachers in 2005 (Wells & Lewis, 2006). As teachers and students became more comfortable with computers in the classroom, school districts continued to purchase computers and reduced the student to computer ratio to 4.4:1 and 3.8:1 in 2003 and 2005 respectively (Wells & Lewis, 2006). At the conclusion of the 2015-2016 school year, more than half of United States students in grades K-12 had access to a mobile device through a one-to-one initiative program (Molnar, 2015). One-to-one initiatives across the United States have been designed to sharply increase the number of computers available to students by ensuring that there is a computer available for every student in the

school. This eliminated the need for students to share computers with one another and has helped to decrease the ratio of students to computers to 1.81:1 nationwide (OECD, 2015).

During this time, technology has become more sophisticated and substantially impacted the manner in which instruction was delivered in the classroom (Zhang, Zhao, Zhou, & Nunamaker, 2004). The skills associated with fusing technology with instruction are not innate to teachers and, therefore, require school districts to focus professional development efforts to build the capacity of teachers to effectively use technology in the classroom. Providing teachers with quality professional development is critical and has a direct impact on teacher performance and student learning (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006).

To design these activities, administrators must have a thorough understanding of the capability of technology, knowledge of effective strategies that promote student learning, and a professional development model that provides teachers with adequate training to incorporate new strategies in the classroom. Providing teachers with quality professional development activities that have a direct impact on student achievement is a challenging task. Quality professional development activities must collaboratively engage teachers in sustained and reflective exercises that are connected with each other and deeply established in inquiry (Darling-Hammond & McLaughlin, 1995). To create this environment, school leaders must engage their staff in job embedded activities that develop strategies relevant to the profession.

Finding activities that meet the needs of teachers requires administrators to understand topics relevant to the needs of teachers and must be delivered in a format that is engaging to participants. Traditional forms of professional development, however, are often criticized for presenting isolated topics to large groups of teachers with little to no follow through or continued support (Kohler, Crilley, Shearer, & Good, 1997). In addition these forms of professional

development rarely solicit input from teachers and occur infrequently throughout the school year. Due to a lack of coherence, many professional development sessions fail to impact the manner in which curricula are delivered to students in the classroom (Showers & Joyce, 1996) and generally have no impact on improving the quality of instruction (Harris & Sass, 2011).

To address this concern, the purpose of this study examined the process of assembling a Professional Learning Community (PLC) to design professional development activities. PLCs can have a profound impact on the manner in which teachers deliver their instruction (Dunne, Nave, & Lewis, 2000; Englert & Tarrant, 1995; Stoll et al., 2006; Strahan, 2003) and have a positive impact on student achievement in the classroom (Louis, Marks, & Kruse, 1994). This study builds upon the current research related to PLCs and examined how a PLC can be used for learning and planning. Specifically, due to the proliferation of technology, the participants of the PLC reflected upon their current practice of using technology to support instruction and the impact it had on student learning while they formed new knowledge and designed professional development activities for their colleagues.

The study collected data by engaging participants in reflective exercises focusing on previous professional development activities and the value it had on building professional capacity. To prepare the participants, I provided them with training on effective elements and characteristics of PLCs prior to officially forming the PLC. Once formed, the PLC shared their knowledge and experiences of using technology in the classroom to support instruction. Through professional inquiry the participants learned about new technology tools and applications that had a positive impact on student learning in their classrooms. As a group, we acquired new knowledge by reading literature highlighting effective elements of professional development activities. By engaging in collaborative reflection, the participants began to form

their ideas in regard to the professional development activities and specifically designed activities for their colleagues. To close the study, I conducted semi-structured interviews on an individual basis to allow the participants to reflect upon the process of using a PLC for learning and planning.

1.1 RESEARCH QUESTIONS

Specifically this study addressed the following research questions:

1. How do secondary teachers who are high level technology users form a Professional Learning Community to share their knowledge and expertise?
2. How can a Professional Learning Community design a professional development plan for colleagues related to using technology to support instruction?
3. What are the perceptions of Professional Learning Community members regarding the effectiveness of using a Professional Learning Community for learning and planning?

1.2 SIGNIFICANCE OF STUDY

Locally, the school district in which this study was conducted, is considering implementing PLCs district wide as means to provide professional development to members of the faculty. To render an informed decision, the school district asked me for a complete summary of the study to determine whether or not the initiative should be pursued. The nature of this study can also

provide valuable information to schools beyond this setting. With the increased use of technology in K-12 education and current research on the positive impact it can have on learning, school districts outside the setting of the study may acquire valuable information on how to design professional development activities that have a greater impact on student achievement and learning. Finally, more broadly, this study moves the research forward in regard to PLCs by examining not only how PLCs can support learning but also how they can be used for planning for professional development.

1.3 DEFINITION OF TERMS

Action Research: A disciplined approach to inquiry where the researcher learns from experience, serves as a direct participant in the research project, and is conducted to refine or improve practice.

Basic Knowledge: Possessing an understanding of fundamental principals of a concept.

Collaboration: The process of interacting and communicating with others to produce or create something.

Professional Development: Formal training provided to educators to enhance their professional capacity in areas such as curriculum, assessment, instruction, pedagogy, and technology.

Professional Inquiry: An inquisitive process engaging members of a similar field by generating questions, formulating new ideas, and sharing outcomes.

Professional Learning Community: A collaborative group of professionals with a common goal of acquiring new knowledge through sustained deep and critical reflection of their professional practice.

Profound Knowledge: Having a thorough understanding of a system or familiarity with the workings of an organization.

Reflection: The process of examining prior practice through deep thought.

1.4 SUMMARY

The combination of the availability of technology in K-12 education and the advancements of the capabilities and applications is likely to continue to have an impact on the manner in which educators instruct and assess their students. Successful implementation of any new initiative in an educational setting is contingent upon the quality of professional development activities prepared for teachers and plays a critical role in enhancing teachers' ability to deliver quality instruction to students (Garet, Porter, Desimone, Birman, & Yoon, 2001). Professional development must authentically engage teachers in collaborative and reflective activities that stimulate professional growth (Darling-Hammond & McLaughlin, 1995). To move forward with building and district initiatives, administrators must find effective methods of providing their faculty members with the skills necessary to implement new strategies. PLCs have proven to be effective in delivering quality professional development, changing the repertoire of teachers, and having a positive impact on student achievement (DuFour, 2004). This study builds upon literature in the field of education and focuses on using a PLC for both learning and planning for professional development activities. This study examined the process of how teachers shared their knowledge and expertise while designing professional development activities for their colleagues within the framework of a PLC. The study further collected and analyzed data related to the participants' perceptions of the effectiveness of using a PLC for learning and planning.

2.0 LITERATURE REVIEW

This study examined the process of how a Professional Learning Community (PLC) designed professional development activities related to using technology to support classroom instruction. The purpose of conducting this study was to improve the quality of professional development activities that are offered to teachers at one specific K-12 school while examining how PLCs can be used for learning and planning. An Action Research approach was used as a framework to conduct this this study. To better understand the study, this chapter begins by covering the recent proliferation of technology in K-12 classrooms across the United States and highlights the impact it has had on classroom instruction. Next it provides a review of professional development and adult learning styles as a means to understand how teachers continue to grow and learn in their practice. Finally, this chapter provided a review of the literature on Professional Learning Communities.

2.1 GROWTH OF TECHNOLOGY USE IN K-12

Student access to computers in K-12 classrooms has consistently grown since the early 1980's in the United States. In 1983, it was estimated that 50,000 computers were available for student use in K-12 classrooms, which translates to a student to computer ratio of 125:1 (Becker, 1990). That ratio decreased significantly when the number of computers available to students increased to 2.6

million by the end of the decade (Becker, 1990). Similarly, the percentage of schools that had computers available for student use increased from 18% to 97% between 1981 and 1990 (Becker, 1990; Office of Technology Assessment, 1988). During this decade the usage of computers in the classroom to support instruction was relatively low. One in four teachers identified their usage as occasional (once a month) and only one in ten stated they were avid users (one or more times per week) (Cuban, Kirkpatrick, & Peck, 2001). By 1995 the ratio of students to computers was 9:1 and more teachers identified themselves as serious users (U.S. Congress Office of Technology Assessment, 1995).

School districts recognized the impact technology was having on instruction and learning. To increase the integration of instruction with technology, 83% of school districts with Internet access offered staff development sessions to their teachers in 2005 (Wells & Lewis, 2006). As teachers and students became more comfortable with computers in the classroom school districts continued to purchase computers and reduced the student to computer ratio to 4.4:1 and 3.8:1 in 2003 and 2005 respectively (Wells & Lewis, 2006).

With the increased number of computers available to students, teachers slowly began to see the impact that access to technology had on student learning. Between 2009 and 2013, the percent of teachers who saw a connection between student use of technology and the development of critical thinking skills grew from 27% to 38% (Project Tomorrow, 2014). In 2013, 46% of administrators surveyed believed that a strategic plan for implementation of technology in the classroom had a significant impact on preparing students for post-secondary studies and career readiness (Project Tomorrow, 2014). As computers became more ubiquitous in the classroom, teachers and administrators recognized the potential impact on teaching and

learning. Furthermore, as more professional development activities focused on the use of technology, teachers became more comfortable using technology in the professional setting.

At the conclusion of the 2015/2016 school year, more than half of United States students in grades K-12 had access to a mobile device through a one-to-one initiative program (Molnar, 2015). One-to-one initiatives across the United States have been designed to sharply increase the number of devices available to students by ensuring that there is a device available for every student in the school. These initiatives eliminated the need for students to share computers with one another and helped decrease the ratio of students to computers to 1.81:1 nationwide (OECD, 2015). Low ratios of students to computers will certainly have an impact on how often and for what purposes computer devices are used in the classroom for a variety of reasons.

The dramatic growth in computing devices in K-12 environments can be attributed to the demands and expectations for online learning and online assessments introduced by the Common Core Standards movement (Futuresource Consulting, 2015). The Common Core Standards movement released standards for mathematics and English language arts in 2010 and underscored the need to integrate technology with instruction to support student learning. During this time, the Common Core Standards emphasized that 21st Century learning must prepare students for the workplace environment and indicated that students must understand ethical and safety issues while navigating sites and communicating with others through the Internet (Rothman, 2012). As a result, students must possess digital literacy skills, critical thinking, decision making, communication, collaboration, creativity and innovation that enable them to function in a world where technology is ubiquitous (Kyllonen, 2012). This becomes possible when students have more access to computers and when teachers supplement their learning activities with technology.

Based on this information, computers are readily available to students and teachers in the learning environment and teachers are expected to use them to support instructional activities. Due to the availability, teachers find themselves using computers to facilitate many tasks that were traditionally done using paper and pencil. In 2010, President Obama introduced the Race to the Top program. Funding associated with Race to the Top awarded Smarter Balanced Assessment Consortium (SBAC) and the Partnership for Assessment of Readiness of Reading for College and Careers (PARCC) with federal grant money designed to create summative assessments to measure student progress on the Common Core State Standards related to literacy and mathematics. In 2016, these two organizations were represented by twenty-three states, and the District of Columbia. Collectively they designed a set of assessments that were diagnostic, formative, and summative in nature. Unlike traditional state exams, these exams were offered exclusively in an online environment. Students in these states needed the ability to effectively read, examine, and annotate online text in order to demonstrate proficiency on the exams. The use of Computer Based Assessment (CBA), as outlined above, has increased across the nation in K-12 education. Tests that were formally administered to students using paper and pencil have been replaced with electronic versions housed online or embedded in computer software. These exams have the capability of providing students and teachers with immediate feedback (Redecker & Johannessen, 2013). The future of the Common Core Standards as well as other educational initiatives may be impacted by the election of President Trump in 2016; however, the role of technology and the impact on instruction and assessment is likely to continue to expand.

2.2 PROFESSIONAL DEVELOPMENT

The success of any reform initiative is contingent upon teachers' individual and collective professional capacity to implement instructional strategies aligned to the initiative (Stoll et al., 2006). Quite often, administrators at the building level are charged with the duty of designing professional development activities that support the growth of teachers' skills related to a reform initiative. This can be a challenging task, as it requires thoughtful planning to have an impact on changing the behaviors of teachers. Professional development plays a critical role in enhancing teachers' ability to deliver quality instruction to students (Garet et al., 2001). Therefore, administrators must design professional development activities to build the capacity of their staff.

However, all too often professional development activities are criticized for having an approach that does not fully immerse teachers in valuable activities and are isolated from classroom practice (Phillips, 2003). The lack of connections between professional development activities and classroom application can leave teachers confused and decrease their motivation when attempting to implement a new initiative. Traditional professional development activities are generally delivered to large groups of staff members (Phillips, 2003) and lack the focus required to have a substantial impact on student learning or change the manner in which teachers deliver their instruction (Garet et al., 2001; Harris & Sass, 2011). Quite often, professional development activities are presented to teachers during a single session and are not revisited again to further develop the needs of teachers. This approach is often counterproductive by encouraging teachers to work in isolation as opposed to fostering a collaborative environment (DuFour, 2004). When professional development lacks necessary connections and relevance to classroom instruction, the results tend to be futile by having no significant impact on teaching

and learning and often results in teacher frustration (Darling-Hammond & McLaughlin, 1995). Therefore, while designing quality professional development activities, administrators must be committed to collaboratively engaging staff members in activities that are meaningful, will transfer to the classroom, and will be revisited again to constantly build the professional capacity of staff members.

A host of characteristics make professional development activities effective. According to Darling-Hammond and McLaughlin (1995), quality professional development is characterized as being engaging, reflective, collaborative, sustained, intense, connected and grounded in inquiry. Using these characteristics, there is a distinct contrast between traditional and effective professional development by placing greater responsibility on the teacher to direct their own learning. From this perspective, teachers are given greater control over building their professional capacity through customized experiences. This type of autonomy has the potential to motivate teachers to engage in valuable activities that have direct connections and applications to providing instruction in the classroom.

These characteristics align closely with adult learning styles. It is therefore beneficial to design professional development activities in a strategic manner where learning continues to develop the professional through series of connected activities with time to reflect and incorporate strategies in the classroom while providing the authority to customize their experience.

2.3 ADULT LEARNING STYLES

There are differences in the manner adults learn when compared to students, therefore it is important for administrators to understand how adults learn best. The differences that stimulate adults to learn are their level of motivation, their prior experience with the topic being taught, their level of engagement in the learning exercise, and the manner in which they value the application of the new skill (Russell, 2006). In the field of education, teachers acquire significant experiences through their daily interactions with students and curriculum. The skills and knowledge they develop can guide how they approach lessons in the future. When teachers have the opportunity to collaborate with other professionals and individually reflect upon their experiences acquired in the classroom they are able to share a wealth of authentic information with one another. A collaborative environment fused with self-reflection can have a significant impact on student learning (DuFour, DuFour, Loertscher, & Eaker, 2010). Furthermore, this practice can help build confidence in educators' ability and motivate them to implement new strategies in the classroom.

American educator, Malcolm Knowles (1913-1997), is well known for his work in identifying key assumptions related to adult learning. Over the years, his study of adult learning evolved and led him to six core principles: need to know; learner self-concept/self directed; learner's experience; readiness to learn (life tasks); orientation to learning (problem-centered); and motivation to learn (internal) (Knowles, 1990). His work indicates that adults need to recognize a purpose for learning in order to engage in a topic and actively pursue learning when the content is of interest to them. Therefore, while designing professional development activities, administrators must make learning relevant for teachers and provide latitude for teachers to direct their own learning activities. Furthermore, with the abundance of real world

experiences teachers gather, they must have the opportunity to apply these experiences, knowledge and skills when they are ready and prepared to extend their learning (Cox, 2015).

Administrators who embrace the principles of adult learning styles and embed them in professional development activities can increase the likelihood of implementing new initiatives (Trotter, 2006). It is important for administrators to understand the significant potential quality professional development activities can have on building the capacity of teachers and the direct impact it has on student learning. While designing these activities, the target audience of adult learners should be taken into consideration and methods of delivery should align with the needs of an adult learner. Administrators must therefore strive to make connections between professional development exercises and classroom instruction so that teachers can rely upon their professional knowledge to apply the new skills being introduced. In addition, professional development activities must capture the interest of teachers and be perceived as meaningful. These types of activities add value to professional practice and increase teacher effectiveness in the classroom.

2.4 PROFESSIONAL LEARNING COMMUNITIES

One method of providing meaningful professional development that aligns with the characteristics of effective professional development and adult learning styles is Professional Learning Communities (PLCs). Although there is no singular definition of a Professional Learning Community it has been broadly defined as a collaborative group of teachers who assemble to share their collective experiences from professional practice in a reflective manner over a sustained period of time with a goal of improving their practice while focusing on student

learning (Mitchell & Sackney, 2000). Based on this definition, PLCs are designed to provide teachers with the opportunity to engage in highly reflective exercises that pull from their professional practice to improve student learning. As practitioners in the classroom, teachers have the ability to collect large volumes of data in regard to strategies that effectively promote student learning. At the same time they experience difficulty in getting all students to achieve at high levels.

A PLC, at its fundamental principle can be traced back to John Dewey (1859-1952) who had a firm belief that the instructional setting is rich with data that can be carefully scrutinized and examined as an entry point to professional inquiry (Dewey, 1929). More recently, other researchers and practitioners advanced models of inquiry for professional growth that have similar characteristics of what has been refined to PLCs.

Inspired by Dewey, philosopher Donald Schön (1930-1997) recognized the value of teachers' technical knowledge of instruction and the ability to reflect upon successful interactions with students in the classroom to form knowledge of effective pedagogy. In what he referred to as the “reflective practitioner”, he endorsed collaboration among teachers to engage in reflective dialog to advance and refine their practice (Wieringa, 2011). This model suggests that professional learning can occur as the result of professionals’ collective ability to reflect upon their actions in the classroom. The terminology has developed over time and is associated with schools that use a reflective practice to examine current practice to enhance educational services and student achievement.

As the communities began to focus more specifically on teaching and learning, the term professional learning community was broadly used to describe the collaborative environment embraced by staff members to focus discussions on improving student achievement by dissecting

professional practice. This type of teacher collaboration, occurring outside the classroom among staff members, can have a significant impact on student learning and the overall professional culture of the building (Louis et al., 1994).

The design of PLCs create an environment where teachers can reflect upon their own experiences while challenging others to think more critically of their practice in a supportive environment (Servage, 2008). This type of setting and exchange of ideas does not necessarily come natural to all participants. In addition, some teachers are hesitant to share personal experiences they encounter in the classroom, however, the research is clear that when teachers engage in highly reflective exercises that promote critical analysis of their classroom practice it has a direct impact on student learning (Mitchell & Sackney, 2000).

2.5 CHARACTERISTICS OF PROFESSIONAL LEARNING COMMUNITIES

Although the literature does not present a prescribed method for forming a PLC (Lieberman & Miller, 2008), there are a variety of characteristics presented that can assist in the formation of effective PLCs. These five attributes of a successful PLC are referenced frequently throughout the literature: shared values and vision; collective responsibility; reflective professional inquiry; collaboration; and group learning (Hord, 2009; Louis et al., 1994). If these characteristics are observed during practice and formation, the PLC has a greater chance of being successful (Wells & Feun, 2008).

2.5.1 Shared values and vision

Shared values and vision is an essential starting point that collectively brings all members together with a common set of beliefs (Hord, 1997). Many school districts commit a great deal of time and effort in developing a mission and a vision statement that is intended to guide the decisions and actions of the district. When created with fidelity, this bond can create a strong framework from which the PLC can operate. But sharing values and vision goes beyond agreeing with what is perceived as being right by investing all members of the organization in a collective goal. This process of involving all members in the creation of the mission and vision creates strong organizations that fosters effective PLCs. Educational organizations that place emphasis on their values and vision use this common focus to make decisions that are centered around student achievement while moving the organization forward to achieve their collective goals (Hord, 1997).

2.5.2 Collective responsibility

Collective responsibility builds upon the characteristic of shared values and vision and holds all members of the organization responsible for achieving goals through making sound decisions. Within the setting of a PLC, teachers must have the authority to make collective decisions. Teacher authority relates to the ability and latitude extended to the teacher to make decisions related to how the PLC operates (Vescio, Ross, & Adams, 2008). Phillips (2003) attributed the success of a small PLC to teachers having the authority to make decisions regarding the means by which they planned to acquire new knowledge. Teachers were given the discretion to select professional readings and dedicated time to working in study groups to thoroughly examine the

readings and apply their learning to lesson design. When teachers are provided with this autonomy and collective responsibility to select their own reading it accurately reflects their individual learning needs about a specific topic. In communities where teachers are provided with a high level of responsibility, teachers take greater ownership in their professional growth objectives and have an overall sense of being more involved (Englert & Tarrant, 1995; Supovitz, 2002).

2.5.3 Reflective professional inquiry

Classrooms are abounding with rich sources of data regarding student learning. Reflective professional inquiry takes advantage of this resource that is readily available to all teachers on a daily basis. Teachers can improve their practice by thoroughly examining their instructional strategies incorporated in the classroom (Spillane & Louis, 1993). This practice can be done in isolation or can be completed by conducting peer observations. To learn from this process, teachers must engage in a reflective process where they deeply question the impact of their approach to teaching and often reconstruct their pedagogy (Louis et al., 1994).

To engage in critical reflection effectively, members of the group must develop a strong sense of community and build trust within the setting (Bolam, McMahon, Stoll, Thomas, & Wallace, 2005). Trust is essential when deeply reflecting upon professional practice while challenging and questioning colleagues' beliefs and approaches to instruction. Deliberate actions such as these within the schoolhouse setting involving both teachers and administrators, with a unified goal of developing their professional skills, have a direct impact on student learning (Clark & Astuto, 1994). As a result, PLCs are designed to foster sustained inquiry and improvement.

2.5.4 Collaborative

PLCs that embrace a collaborative environment for teachers have a positive impact on the classroom environment and student achievement (DuFour, 2004; Louis & Marks, 1998). After examining multiple forms of PLCs, Mitchell and Sackney (2000) generalized the characteristics as a collaborative group of professionals with a common goal of acquiring new knowledge through sustained deep and critical reflection of their professional practice. In order for groups to be collaborative in nature, groups must be of a manageable size where members of the group feel connected to one another (Supovitz, 2002). In a small group setting, Phillips (2003) found that common professional collaboration time had a direct impact on the quality of lessons designed to increase student achievement. This group collaborated while designing new lessons and observing each other while delivering the lessons in their classrooms.

Similarly, Berry, Johnson & Montgomery (2005) observed teachers working in a small PLC watching videos showcasing instructional reading strategies. While watching the videos, the group collaborated with one another and discussed their own related experiences in the classroom and the impact it had on student learning. The collaborative environment in this study created an environment where teachers felt safe to openly discuss classroom experiences while providing each other with constructive feedback.

Creating an environment where teachers feel safe to examine classroom practice while challenging their own beliefs, as well as others, can create new learning and ultimately have a positive impact on student learning (DuFour, 2004). PLCs must press collaboration to go beyond superficial discussions void of deliberation where ideas are critiqued and refined. This type of collaboration involves focused conversation, questioning, reviewing, examining, and challenging ideas while cultivating a deep level of reflection.

2.5.5 Group learning

Quite often traditional professional development activities focus on improving teachers' individual ability to teach in isolation and do not take advantage of group learning. Although individual learning has produced positive results in many professional development situations, PLCs shift the focus from learning in isolation by placing greater emphasis on learning in collaborative groups and focusing on student outcomes (Louis et al., 1994). This change in philosophy and dedication to ensuring that students are learning in the classroom has a dramatic effect on the quality of the professional development (DuFour, 2004). Student learning can be measured using a variety of tools. Teachers therefore have the opportunity to collaboratively examine instructional strategies that result in student learning and strategies that did not promote growth.

The school principal maintains an active role in establishing the culture in the building. A school that strives to create a culture of shared values where decisions are made with staff input and where there is commitment to actively learn together requires a building principal who embraces a model of shared decision making (Hord, 1997). Shared decision making and group learning capitalizes on the strengths of a diverse population within an organization. The principal of the building provides multiple opportunities for staff members to participate in making decisions related to aspects of the school. When exercised in the educational setting, this approach can help organizations achieve professional development goals and can also bolster school improvement initiatives (Harris, 2004).

2.6 IMPLEMENTING A PLC

Ensuring that each of the characteristics is present during the implementation of a PLC requires significant planning. As the leader of the building, and primary designer of professional development activities, the building principal assumes a significant role while forming and implementing a PLC (DuFour et al., 2010). At the core of educational leadership is the recognition of the responsibility that all students must learn and achieve at high levels (DuFour & Marzano, 2011). To create this environment, principals must have a firm understanding of the local curricula, the assessment procedures required to determine if students are reaching the outlined goals, and how the organization will respond to support students who require enrichment or differentiated instruction.

A school that is committed to reaching all students in this manner must work collaboratively (DuFour & Marzano, 2011). Collaboration extends beyond traditional team meetings where educators focus on the daily routines of the day and plan for upcoming events. Collaboration is not limited and confined to assigning staff members to groups to work on a project or new initiative. Collaboration must be focused on student performance and success in a manner that is sustained throughout the course of the school year (Darling-Hammond & McLaughlin, 1995).

Principals have a significant amount of control regarding how the school day is structured and the manner in which meetings and professional development sessions are conducted, therefore providing time and appropriate resources for team members to collaborate is essential. At the onset of initiating a PLC, the principal must make clear the expectations of the group. Establishing a set of standards for interaction and decision-making can assist with making this clear to all members (DuFour et al., 2010).

The principal serves as the building leader; their vision and expectations for staff members can guide the culture of the building. Therefore, principals who seek to implement PLCs as an effective means of impacting student learning must immerse themselves in the process and become actively involved in collaborating with staff members. When staff members recognize that they have the support and trust of the principal, they are more likely to share their beliefs and values more openly (Strahan, 2003). This creates an environment where the principal can get a true understanding of the needs of the staff. This knowledge can be applied to provide the proper amount of support and resources necessary for staff members to be successful. While working in a PLC, it is important to maintain the physical space that supports the needs of the team by having access to essential tools such paper, writing instruments, planning calendars, student data.

While choosing a topic to address with a PLC it is important to make the topic relevant to the needs of the building. Developing SMART goals assists the team on staying focused on the end result. SMART goals are Strategic and specific, Measurable, Attainable, Results oriented and Time bound (Conzemius & O'Neill, 2009). Goals that are designed effectively help organizations get results.

2.7 OUTCOMES OF A PLC

PLCs foster an environment of shared decision making on topics that are closely related to student achievement and learning. PLCs therefore, have the potential to unite a collective group of professionals in school improvement initiatives that have a sustained impact on teaching and learning. The collaborative environment supported through a PLC can produce a staff that is

focused on student learning and often leads to better quality teaching in the classroom (Louis & Kruse, 1995). Due to the nature of a PLC, educators are able to acquire knowledge from others and form new knowledge by sharing practical experiences from the classroom with one another. When decisions are made as a team and teachers guide their own learning, they are more enthusiastic and prepared to implement new initiatives in the classroom that produce positive results for students (Servage, 2008).

2.8 SUMMARY

The proliferation of technology available to teachers and students in classrooms throughout the United Sates has dramatically increased in K-12 schools. The presence of technology in the classroom has reformed the manner in which teachers deliver instruction to students. Successful reform initiatives are the result of individual and organizational capacity to implement instructional strategies aligned to the initiative (Stoll et al., 2006). To prepare teachers to be successful with reform initiatives, building principals are quite often responsible for designing professional development activities that build the capacity of their teachers to implement the desired skills aligned to reform initiatives. Because professional development plays a critical role in enhancing teachers' ability to deliver quality instruction to students (Garet et al., 2001), designing professional development activities to enhance the professional knowledge and skills of teachers is an important task for building principals. Therefore, principals must effectively prepare to design professional development activities to build the capacity of their staff.

The study was framed around using a Professional Learning Community (PLC) to design professional development activities. PLCs feature many of the qualities outlined by effective

professional development and can positively affect student achievement (DuFour, 2004). Historically, the design of PLCs fostered a collaborative environment where small collaborative groups of teachers engaged in reflective exercises to focus on their practice in the classroom with a goal of improving student learning. This study incorporated and built upon the literature related PLCs and assembled a group of teachers who were identified as high-level technology users. This study examined how teachers used their prior knowledge to deepen their understanding of technology while designing professional development activities for their colleagues and provided an opportunity for teachers to reflect upon their involvement in a PLC to acquire an awareness of their personal growth. In doing so, this study moves the research forward in regard to how PLCs can be used as a model to learn and plan.

3.0 RESEARCH DESIGN

The review of literature presented in the previous chapter highlighted the proliferation of technology in K-12 schools across the United States and stressed the significance of providing teachers with quality professional development when seeking to implement any new initiative or instructional strategy. Professional Learning Communities (PLCs) are documented to have a significant impact on instruction and learning when used as a professional development model. The literature in this area presents an array of characteristics that contribute to an effective PLC.

This chapter builds upon the review of literature and describes the methods that were incorporated into this study that harnessed many aspects of the literature. Specifically, this chapter will describe relevant historical context, my involvement as a participant, and the strategic manner in which participants were selected. Furthermore, the chapter will describe the research methods, the qualitative instruments used to collect the data, and describe how those data were analyzed. The Appendix section clarifies the instruments and shares the guiding questions used during group discussions and semi-structured interviews. The chapter closes with the limitations often presented with Action Research studies, how those limitations were addressed, and describes how the results of the study are reported.

3.1 PURPOSE OF THE STUDY

This study examined the process of how a Professional Learning Community (PLC) designed professional development activities to improve the use of technology in the classroom. Recently, the growth in the number of school districts across the United States implementing one-to-one technology initiatives has been substantial. With the significant investment school districts are making to provide greater access to technology in the classroom, school districts hold high expectations that technology is being effectively fused with classroom instruction to improve student learning. The challenge many school districts encounter is building and supporting the professional capacity of all teachers to implement effective instructional strategies in the classroom.

This study focused on how a district specific PLC designed professional development activities to support instructional lessons that utilize technology. To help understand our current model of professional development, the participants engaged in a group discussion to reflect upon their previous experiences with professional development. A professional group discussion protocol (Appendix C) was used to guide this discussion to collect data on the participants' involvement in planning and delivering professional development activities as well as other areas such as engagement, collaboration, and the impact size of membership had on the experience. After forming our PLC, the participants reflected on their perceptions, knowledge, and skill level regarding the use of technology in the classroom. Building upon the reflective exercise, the PLC worked collaboratively to increase their knowledge of professional development and technology usage. To accomplish this task, the participants read four articles outlining effective elements of professional development when providing training on technology usage. The participants further engaged in professional inquiry through collaboration focused on their experiences and

knowledge regarding technology usage in the classroom. After acquiring new knowledge and formulating new ideas, the participants collectively designed a professional development activity for their colleagues. The final aspect of the study explored the value of implementing a PLC by collecting data on the participants' perceptions regarding the effectiveness of using the PLC for adult learning and planning. The following research questions were used to guide the data collection of the study.

3.2 RESEARCH QUESTIONS

Through an Action Research approach, the following questions were explored:

1. How do secondary teachers who are high level technology users form a Professional Learning Community to share their knowledge and expertise?
2. How can a Professional Learning Community design a professional development plan for colleagues related to using technology to support instruction?
3. What are the perceptions of PLC members regarding the effectiveness of using a PLC for learning and planning?

3.3 THE CONTEXT

This study was conducted in a large suburban senior high school located in Allegheny County, Pennsylvania where I am entering my third year as the Principal. I made the transition to this school district in 2015 after acquiring twenty-two years of experience in education. At that time

I had eleven years of experience as an instructional leader in a neighboring school district. During the 2014/2015 school year, the district outlined a six year technology plan called Focus 2020. This plan placed significant emphasis on the role of technology in the classroom and implemented a timeline for the district to roll out a 1-1 initiative where all students would be issued a mobile device. This had a direct impact on the senior high school where all students would receive a laptop computer during the 2016/2017 school year.

To prepare teachers to reform the manner in which they delivered instruction to students, they were provided with professional development activities regarding the use of Blackboard. Blackboard is a learning management system that provides teachers with a variety of technology tools to deliver instruction and assess student knowledge. These professional development sessions were delivered in either a large group settings or smaller groups while working with other members of their department. By observing classroom lessons in my first year, I recognized some teachers were naturally emerging as leaders in the field by incorporating technology into instruction. In addition, I recognized there were teachers who struggled with basic applications of using a computer to support instruction. Collaboration among staff members was informal and was generally isolated to teachers within their curricular departments. My priority was to institute a professional development framework that was more collaborative in nature that allowed teachers to interact with one another and learn from their experiences.

To accomplish this goal, I worked closely with our Technology Integrator to identify teachers who were proficient at using technology in the classroom. In my second year, I designed professional development activities where these teachers presented technology lessons to their colleagues in group settings consisting of twenty to twenty five teachers. I created this model to allow teachers to choose activities that aligned with their technology readiness level

and areas of interest. Although teachers had the opportunity to choose from a selection of professional development activities, they did not have the opportunity to actively participate in designing the activities.

Historically, the school district has not used a collaborative model to deliver professional development activities. In the fall of 2016, I had a discussion with our Assistant Superintendent regarding professional development. An initiative the district was interested in pursuing was related to using Professional Learning Communities as a form of ongoing professional development. This discussion, combined with my priority to establish a collaborative professional development model, helped form the framework of this study to use a PLC to design professional development activities.

The building provides educational services to nearly 1,400 students in Grades 11 and 12 with 97 instructional staff members. Eighty four percent of the students identify themselves as White, 13% Asian, 2% African American, and 1% Pacific Islander, Hispanic, American Indian/Alaskan Native, or Multi Racial. The district is situated in a suburban area where 6% of the students are identified as economically disadvantaged, 0.45% English Language Learners, and 6.5% of the students receive special education services.

The recently adopted one-to-one technology initiative provides all students in Grades 9-12 with a laptop computer and students in Grades 6-8 with iPads. Students are expected to maintain their computers by abiding by an acceptable use policy and carry their devices to and from school. Teachers are expected to actively use the technology to support learning activities in the classroom. At the high school level students keep their devices over all breaks, including summer vacation, and are encouraged to use them to supplement their learning goals.

The school district developed a comprehensive plan comprised of six major goals to guide the achievement of delivering the mission and vision. One specific goal states that the district will innovate their educational practices and become leaders in technology integration. The genesis of this goal was founded in the belief the district is obligated to immerse the students in a technology rich environment that simulates the demands and expectations of the real world.

To support the professional development of teachers in the area of technology, the school district hired full time Technology Integrators at each of the three middle schools, the intermediate high school and the senior high school. The role of the Technology Integrator is to work closely with the teaching staff to plan and deliver lessons that effectively use technology to enhance and transform learning.

3.4 THE PARTICIPANTS

As the building principal, I directly observe teachers in the classroom. During observations, I make note of teachers who use technology extensively to transform learning activities that engage students in meaningful lessons. In addition, I have standing weekly meetings with our Technology Integrator who is charged with the responsibility of working with faculty members to assist them with designing, planning, and implementing classroom lessons that effectively incorporate technology. Prior to conducting this study, we actively discussed specific teachers who emerged as leaders in the building and were recognized as high-level technology leaders. These high-level technology leaders possessed basic knowledge relevant to this study based upon their classroom experience and professional training.

The planned result of the activity embedded in this study was to design a professional development activity for teachers in the building. To design relevant and meaningful activities for all teachers, I used our identified list of high-level technology users to select teachers from a variety of disciplines to solicit input from an interdisciplinary group. In addition, I narrowed the list of potential participants to those teachers who acquired at least five years of experience in the building. In addition to being recognized as high-level technology users, this selective sample of participants possessed the historical knowledge related to professional development activities traditionally used to build the capacity of staff members. Subsequently, I selected an English, math, science, social studies, and world language teacher to participate in the study.

An invitation to participate in the study was sent to this purposeful selection of faculty members. The invitation included the purpose of the study, the scope of the study, the expectations of participants, and the timeframe of implementing the study. Teachers who were interested in participating in the study were asked to reply to the email. All five teachers invited to participate accepted the invitation. In addition, the Technology Integrator was invited to participate. The invitation letter can be found in Appendix A.

Within the research design, specified more clearly below, I served as an active participant in the PLC. In doing so, I performed my regular duties as the building principal and capitalized on learning opportunities presented in the study while sustaining field notes and reflected on the process. Data related to the behaviors exhibited within the PLC were collected through observations, semi-structured interviews, group discussions, self-reflection, and field notes. Section 3.7 outlines how the data were analyzed.

3.5 OUR PROFESSIONAL LEARNING COMMUNITY

As the building principal and active participant in this study, I used the literature in Chapter 2 to plan the activities to implement our professional learning community. Prior to forming the group, all participants received a letter (Appendix A) that provided the framework for the study and informed participants their main goal was to design a professional development activity for their colleagues. The first three meetings were highly structured where I led a group discussion, provided training related to the attributes of PLCs and transitioned to writing a SMART goal to guide our future decisions and actions. During the third session we began to reflect upon our experiences with technology in the classroom and started to formulate ideas for our professional development plan. The remaining three sessions were not as structured as the first three and transitioned ownership of the PLC to the participants so they could use their prior experiences to develop our professional development plan. The specific details of these sessions are thoroughly described in Chapter 4.

3.6 RESEARCH PROCEDURES

Action Research (AR) is a form of inquiry where the researcher learns from experience and serves as a direct participant in the research project. AR is designed to change current practice through producing new knowledge and empowering participants while finding practical solutions to current problems (Bradbury-Huang, 2010; Brydon-Miller, Greenwood, & Maguire, 2003). This type of research is popular in social science fields that provide assistance to other fields such as education, social work, and health care. The process often builds professional capacity

or knowledge and can serve as focused professional development (Sagor, 2000). It uses a disciplined approach and is designed for the benefit of the researcher's field of study and the participants themselves.

While Kurt Lewin is often credited with being the founder of AR in the 1940's, the methodology and research paradigm can be traced back to Aristotle, with his use of the term Praxis (O'Brien, 1998). He viewed Praxis as an individual's deliberate action in response to presented conditions to engender change. Aristotle believed both theory and knowledge were essential. Quality AR effectively blends theory and knowledge from a practitioner's perspective. The study was approached from an emic perspective to truly harness the experience of those affected by the research. An emic approach to conducting research uses the participants' perceptions and knowledge as an entry point to the study (Morey & Luthans, 1984).

Action Research is designed to understand and improve a designated condition by engaging both the researcher and the participants in a collaborative and reflective process. Through this process, participants use their profound knowledge of the organization to institute change at the local level. For the purpose of this study, the profound knowledge I was seeking while selecting participants required them to understand the culture of the faculty in our building and to have experience with previous professional development activities designed to support growth initiatives.

If conducted properly, the participants can benefit greatly from the experience by acquiring new knowledge while improving their independent practice (Bradbury-Huang, 2010). In addition, AR can be an empowering experience because it heavily engages both the researcher and the participants directly involved in the study. Therefore, AR can be used in an educational setting to improve or refine professional practice (Sagor, 2000). Because this study places the

researcher as an active participant in a PLC, while seeking to improve the quality of professional development, AR is well suited as a method to design the research.

Specific methods used to collect data relevant to this study relied heavily on qualitative data. AR shares some similarities with qualitative research in regard to the reliance of the knowledge of practitioners and collects data using instruments such as maintaining a field notes, observations, discussion tools, and semi-structured interviews (Bradbury-Huang, 2010).

Action Research has the potential to collect a large volume of data in a qualitative study. The design of the study allowed me to collect data on the process used by a district specific PLC as it acquired knowledge and designed professional development activities related to using technology to support classroom instruction. These data were collected using observations, group discussions, and semi-structured interviews.

As the building principal, I directly observe teachers in the classroom. During observations, I make note of teachers who use technology extensively to transform learning activities that engage students in meaningful lessons. In addition, I have standing weekly meetings with our Technology Integrator who is charged with the responsibility of working with faculty members to assist them with designing, planning, and implementing classroom lessons that effectively incorporate technology. Prior to conducting this study, we actively discussed specific teachers who emerged as leaders in the building and were recognized as high-level technology leaders. These high-level technology leaders possessed the basic knowledge relevant to this study based upon their classroom experience and professional training. In addition, this group was comprised of teachers who acquired at least five years of experience in the building and possessed the profound knowledge related to professional development activities traditionally used to build the capacity of staff members. The planned result of the activity

embedded in this study was to design a professional development activity for teachers in the building. To address the needs of all teachers, I selected teachers from a variety of disciplines to make the activity relevant for all teachers in the building.

A group discussion was conducted prior to officially assembling the PLC. It was conducted in a group format to assist with the format of the PLC so that the participants could familiarize themselves with one another and get accustomed to a collaborative environment that fostered reflective thinking. While designing these questions I took into consideration the literature presented in Chapter 2 related to the characteristics of quality professional development, the manner in which adults are stimulated to learn learning styles, and effective attributes of PLCs. The questions used to guide this discussion are found in Appendix C and were used to collect data on the participants' prior experience with professional development.

During a separate session, following the group discussion, I reviewed the literature highlighting attributes of PLCs that contribute to making PLCs effective. This was an important step as it informed the group members of how the PLC would function and guided the manner in which participants interacted with one another during the study. In addition, a set of standards that summarized the norms of a PLC was distributed to all participants of the group (Appendix E). Setting and sharing standards with a group serves as an effective means to sustain a PLC by keeping members focused on the behaviors essential for functions PLCs (DuFour et al., 2010). Participants were also granted to the opportunity to review the list to add or delete any of the standards. The participants decided to add a tenth standard: "We will remain focused on representing the needs of our colleagues." After learning the attributes and characteristics of a PLC, the group then developed a SMART goal (Strategic and specific, Measurable, Attainable, Results oriented and Time bound) to focus the work of the PLC. SMART goals can be used to

effectively implement PLCs and keep members focused on the task that will be accomplished (Conzemius & O'Neill, 2009). The group then set a meeting schedule to accomplish the SMART goal and began meeting on a regular basis.

Once formed, the PLC determined areas in which they required additional training prior to designing professional development activities for their colleagues and organized their efforts to secure this information. As an active member of the PLC, I assisted the group in locating relevant literature to build their capacity in specified areas. Throughout this process, I observed behaviors, took field notes, and reflected upon my own learning in the process.

After the group completed the objective outlined by their SMART goal, I conducted semi-structured interviews on an individual basis to conclude the study. To design these questions I used the literature in Chapter 2 specifically related to the five attributes of successful PLCs: shared values and vision; collective responsibility; reflective professional inquiry; collaboration; and group learning. The questions used to guide these interviews can be found in Appendix D and provided an opportunity for participants to reflect upon their experience of using a PLC to design professional development activities for their colleagues.

Action Research has the potential to collect a large volume of data. The design of the study allowed me to collect data on the process used by the PLC as it acquired knowledge and designed professional development activities related to using technology to support classroom instruction. These data were collected through direct observation of behaviors, group discussions, semi-structured interviews, and were recorded with transcripts, a self-reflective journal, and field notes.

The qualitative data instruments designed to collect data for this study were designed to capture data prior to, during, and after the formation of the PLC. To enhance the validity of the

data, the group discussion and semi-structured interview prompts were piloted with colleagues in the field such as teachers, administrators, central office administrators, and college faculty members. The value of piloting the questions enhanced their credibility and provided feedback on the clarity, coherence, and relevancy of the questions prior to use in the study.

3.7 DATA ANALYSIS

This study looked for connections and relationships among the participants of the study using field notes, reflective journal, observation, group discussions, and semi-structured interviews to collect the data. During the analysis, I carefully reviewed and synthesized the data collected to gain a deeper understand of the research questions. Merriam (2016) defines the process of analyzing qualitative data as "recursive and dynamic." In other words, the act of analyzing the data is not stagnant or isolated but is embedded throughout the data collection phase and continues through the end of the study. Maintaining a reflective journal throughout the study allowed me process and code data throughout the duration of the study. Below is an overview of the data analysis process.

3.7.1 Coding data

The use of coding served as a framework to draw final conjectures and findings. Coding is the process of using symbols, notations, or shorthand to identify potentially important units of data consistently found throughout the data and provides a system to easily retrieve and sort the data. Merriam (2016) further recommends that data analysis through coding begin immediately

following the first data collection session. Therefore, upon completion of each work session conducted with participants, I reviewed and coded my field notes. I used this exercise to gather my thoughts, recorded them in my reflective journal and additionally wrote about my learning in the process. Following the audio-recorded group discussion and semi-structured interviews, I immediately transcribed the data. Self-transcribing adds a dimension that allows the researcher to become more familiar with the data. An *open coding* technique was initially employed to collect significant units of data by paraphrasing or rewriting statements in the right hand margin. The left hand margin was used to record thoughts, speculations, and hunches that were used to triangulate data and determined if additional data were required.

As the study continued and additional data were collected, *axial coding* (Corbin & Strauss, 2015) was employed to define the emerging broad categories while assigning meaning to the data. During this process, I looked for themes and connections among the individual units of coded data and placed them into categories using an inductive and comparative strategy. Categories established during the axial coding stage were further refined into a smaller set of categories and similarly were used later in the study to analyze and process data collected through other sources such as observations, field notes, literature review, group discussions, and semi-structured interviews. By refining the categories, the analysis aspect of the study narrowed on specific findings that were aligned to the research questions. Review and analysis of the data housed in these categories determined if additional data were required to substantiate emerging trends. The notes in the left hand margins were used to craft new questions or seek additional information from other sources to confirm or support the emerging trends and initial findings. This process is supported by Merriam's (2016) approach and defines the analysis phase by

migrating from an inductive and comparative strategy to a deductive strategy where the researcher specifically looks for additional data to support initial findings.

3.7.2 Validating of data

Data gathered from a variety of sources provided an opportunity to triangulate data. Triangulation uses data to examine a phenomenon from multiple perspectives. The greater the reference points, the more accurate of a conclusion can be drawn from the data. To triangulate the data, I looked for connections among my coded data gathered from the group discussion, semi-structured interviews, field notes, journal reflections, and literature. This study was conducted over a period seven weeks and collected a large volume of data of from the six participants. Quite frequently, similarly coded data was found throughout my transcripts and field notes. When this occurred I analyzed the data to validate the code was consistently referencing the same context. I further searched for matching data that was coded in my journal entries and sought to find research to support a finding. As findings were generated, I looked for the research question that aligned to the finding. By going through this iterative process, I was able to compare multiple sources of data. Triangulation of data occurs when a researcher uses multiple sources of data such as semi-structured interviews, group discussions, observations, field notes, self-reflection and literature reviews to compare and cross-examine collected evidence and is a robust tool to increase the internal validly of the study (Merriam, 2016, p. 245).

When strong connections are made across multiple sources of data the more substantial, meaningful, and reliable conjectures can be drawn. The categories created during the axial coding phase created a common area of focus that triangulated data collected from multiple

participants. Triangulation of data substantiated the preliminary findings related to the research questions.

Another strategy embedded in this study provided participants the opportunity to review the transcripts that were taken during the study. After I transcribed the data from the semi-structured interviews, I provided each participant with a copy of the transcript. I asked the participants to review the transcript and provide any additional information they may have neglected to share. Although no substantial edits to the transcripts were recorded, this strategy can be valuable for individuals who thought more deeply about the interview session afterwards.

A *respondent validation* (Merriam, 2016, p. 246) strategy was implemented to increase the validity of the study. This strategy was conducted just prior to administering the semi-structured interviews toward the conclusion of the study. I chose to conduct this strategy at this time to help ensure that I had a clear understanding of the initial findings prior to the semi-structured interviews. While meeting with the participant, I briefly explained the procedures I used to generate my initial finding. I reviewed the steps we used to conduct the study and shared each of my findings and asked her to provide feedback on the accuracy of my conjectures. This interaction was valuable as it provided me with additional confidence my initial findings were accurate. The key difference in the transcript review validation strategy and the respondent validation strategy was that this strategy presented the participant with analysis of the data as opposed to the raw data. Implementing the respondent validation strategy confirmed my initial findings from the data.

3.8 LIMITATIONS OF THE STUDY

Because the majority of Action Research focuses on a local issue, it can be challenging to apply the findings to a broad audience (Brydon-Miller et al., 2003). This particular study presented limitations from having only one researcher in the field as opposed to multiple researchers. Therefore, during the course of the study it was important for me to be conscientious of my personal bias and predetermined beliefs so that conjectures were made in isolation of these propositions. This was especially concerning as one of my priorities was to design a professional development model that was more collaborative in nature compared to previous activities to build professional capacity. To accommodate for this limitation, the respondent validation strategy assisted me by soliciting input from a selected participant to review preliminary findings and analysis.

The issue of bias does not end with the researcher. Stakeholders who participated in the study through observation or interview can harbor their own biases toward professional development, technology, or any related aspect of the study. This limitation is also relevant to this study due to the strategic sampling of selecting participants for the study. I invited members of the senior high staff who were viewed as high level technology users. Because of this strategic sampling, it is possible these participants are more receptive to reform initiatives and professional development activities. To address biases held by participants, I incorporated internal validation strategies, such as triangulation of data, respondent validation, and transcript review, while analyzing the data. Isolated comments that were not supported through the means of triangulation were not considered as valuable data and therefore did not produce erroneous findings.

Making generalizations from single studies can present a challenge due to the research being studied in isolation. In contrast, experimental designs often use a series of experiments where the phenomenon is exposed to a variety of conditions. Based on the number of experiments conducted, statistical generalizations can be made and applied to other areas in the field. To address this challenge, this study made analytical generalizations by examining the data in relationship to existing literature associated with the research questions.

3.9 REPORTING THE RESULTS OF THE STUDY

Merriam (2016) indicates that a standard format or template does not exist to report the findings of a qualitative study. The titles of the remaining three chapters in this study are Analysis and Findings, Interpretations and Meaning, and Next Steps and Implications. These chapters are written in a manner that is intended to be engaging and meaningful to the primary audience reading the report by including specific data recorded in the study.

One important phase of planning to share the report is to understand the audience (Yin, 2009). My intended primary audience for this study is a wide range of members in the field of education. These members include individuals at the local level including teachers, principals, and central office administrators. My goal in the upcoming chapters is to provide valuable information to this group of stakeholders to assist them in rendering decisions regarding best methods to provide professional development activities to increase the capacity of using technology to enhance instructional lessons.

The implementing the study chapter will examine the data collected in the study for the purpose of extracting meaning. When presenting the findings, it is common for researchers to

share their findings by organizing them into categories, themes, or theories developed by analyzing the data (Merriam, 2009). Several themes emerged as a result of conducting this study and are noted through the use of subheadings under the general categories of the remaining chapters. These tools for organization are designed to tie directly back in to the research questions with a goal of analyzing through multiple perspectives and providing meaning to reader. The interpretations and meanings chapter begins with a brief overview of the key findings presented in Chapter 4 and specifically supports each finding with evidence from the study and literature presented in Chapter 2. The next steps and implications chapter closes out the study and demonstrates what I learned in the process of investigating this phenomenon. Reflection upon learning and the impact on professional practice can be extremely valuable (Wlodarsky, 2009). This chapter will promote thoughts on further areas of research related to this topic.

4.0 IMPLEMENTING THE STUDY

This study used an Action Research approach to improve the quality of professional development that is offered to teachers while examining how Professional Learning Communities (PLCs) can be used for learning and planning. This chapter will share an overview of the study implementation and data gathered. Data were gathered while conducting semi-structured interviews, discussions, and observations and were captured using audio recordings, field notes, and personal reflections.

To analyze the data, I transcribed and coded each recorded session immediately so that the information was fresh in my mind. During work sessions, I collected field notes through direct observation of the participants and again coded the data immediately following each session. To reflect upon my own learning in the process, I maintained a personal journal to record my thoughts and professional reflections.

I implemented an open coding technique to analyze the data by paraphrasing or rewriting significant units of data in the right hand margin of the paper. I used the left hand margin to record my thoughts and speculations that were used to triangulate the data. After the third session, I employed an axial coding strategy by looking for themes and connections among all units of data collected to answer the following research questions:

1. How do secondary teachers who are high level technology users form a Professional Learning Community to share their knowledge and expertise?
2. How can a Professional Learning Community design a professional development plan for colleagues related to using technology to support instruction?
3. What are the perceptions of PLC members regarding the effectiveness of using a PLC for learning and planning?

The procedures used to conduct this research started with a group discussion focusing on the participants' prior experience with professional development activities conducted by the school district. The participants of the study were invited based on their ability to use technology in the classroom. The Technology Integrator and I, identified high-level technology users in the classroom. The members of the group consisted of an English, math, science, social studies, and world language teacher along with the building's Technology Integrator. As the building principal, I also served as a direct participant in the study. These members of the various departments aligned to the intended outcome of the study to design professional development activities for all senior high school teachers in the building. Having representatives from all major content areas presented multiple perspectives of previous experiences with professional development. This strategic sample strengthened the capacity of the PLC to design professional development activities that would add value to the entire staff.

During the first meeting, I reviewed the main components of the study being conducted to familiarize all participants with the process. This framework, in addition to the information contained in the invitation letter, helped the participants understand the overall direction and expectations for the study. This overview of the study served as a natural introduction prior to

conducting the recorded session that focused on the participants' previous experience with professional development conducted at the district and building level. I informed the participants, that prior to officially forming our PLC we would share our previous experiences with professional development activities conducted by the school district.

Prior to conducting the study, I used the literature presented in Chapter 2 to carefully plan the first three sessions to provide a strong foundation for engaging the PLC in our activity. The schedule below outlines the topics that were covered during each of the meeting sessions:

Session 1: Group discussion on previous experience with professional development

Session 2: PLC Training

Session 3: Writing a SMART Goal

Session 4: Increased knowledge of professional development and formulate a plan

Session 5: Reflection on the use of technology

Session 6: Reflection on technology and finalize a plan

Session 7: Semi-structured interviews

During the first session, I used the Professional Group Conversation Protocol found in Appendix C to lead the discussion. As the principal, I approached the second session as a tradition professional development session where I shared the definition of a PLC and provided training on the attributes of effective PLCs. At the end of the second session I shared the standards for which we would operate and make decisions moving forward. I slowly began to transition ownership of the PLC to the participants by asking them for feedback on these standards and allowed them to make revisions. While writing the SMART Goal in session 3, I encouraged the participants to take full ownership of the goal. The remaining sessions were not

scripted in advance, however, continued to implement the framework of a PLC. The next section presents the information learned from the first session.

4.1 PARTICIPANTS' PREVIOUS EXPERIENCE WITH PROFESSIONAL DEVELOPMENT

Prior to officially assembling the PLC, the participants met to discuss their previous experiences with professional development activities at the building and district level. The purpose of this activity was to collect data on how often teachers were involved in planning and executing professional development activities. In addition, I designed the activity to collect data on the relevance of the activities, the impact that the size of a professional development group had on the value of the activity, and the amount of collaboration that occurred during the activities. This section shares the data collected during the group discussion session.

The participants of the study collectively identified receiving professional development at a variety of levels. They quantified their professional development experiences using the following descriptors: district, departmental, building, and individual level. While collecting data during this discussion, I carefully distinguished the experiences based upon the professional development setting while coding the data. During this phase of the study, I found that the participants of the PLC had both positive and negative experiences with professional development activities. By comparing and contrasting their experiences within the different settings, they were able to identify characteristics of professional development that contributed to the value of the activity. The next four sections summarize the findings of experience based

upon the different levels of professional development and do not assemble the data chronologically as it occurred during the discussion.

4.1.1 District wide professional development

Data collected for the district wide professional development model revealed that these activities were more likely to be delivered to large groups of teacher either in auditoriums, cafeterias, or large group instructional areas. Due to the sheer number of staff members participating in these activities, teachers reported that during these professional development sessions there was not a significant amount of time dedicated to collaboratively engaging teachers in dialog, “we’ve been asked to turn to a partner and pair share, but the conversation quickly gets off task, so I would not say we really don't collaborate with one another.”

To facilitate these large group professional development activities, presenters often used PowerPoint presentation to supplement the lecture-based approach to sharing information. The lecture-based approach, delivering training to large number of staff members was reported to be ineffective, as it did not fully engage the participant in the learning exercise. “You can’t expect a large group of teachers to stay focused on a lecture for that long, it goes against everything we are expected to do with our students in the classroom.” Due to the nature of the information shared, the participants indicated the activities could have incorporated alternative measures to more effectively deliver the training in smaller groups.

The lack of engagement experienced closely associated with the number of distractions present in large group settings and the length of the activity. In some circumstances, these large group professional development activities required staff members to collaborate with colleagues sitting in close proximity. However, the noise level in these venues did not support an

environment to share ideas or reflect upon the presenter's topic. Furthermore, the large group environment created distractions that prohibited members from focusing on the topic. One participant stated, "even if you break up 180 people in a large room into groups of five, it still gets very loud so you can easily get distracted." Another participant added, "Sometimes I get caught up listening to another group's discussion because we are so close to each other."

In other circumstances, the members of the study indicated there were opportunities to break into smaller groups following a presentation. This method combined with having an assigned facilitator at the small group level had a direct impact on engagement and collaboration. "One time we started in the auditorium and listened to a presentation on Marzano, then we went to different rooms with a principal . . .then we were able to talk to each other without a lot of distractions, that was better." The group noted, however, that this technique was an isolated occurrence.

Although the topics presented in large group professional development activities were reported as relevant to education, the participants agreed they "cannot take what is presented and directly apply it to my classroom, sometimes it just doesn't fit." Another participant stated, "Not every discipline is going to be universal, there are things that Linda uses that just don't pertain to perhaps my room or Ed's room." Therefore, the large group professional development activities have not made clear connections to the classroom and lacked an immediate impact on teaching and learning. This lack of connection and impact on teaching and learning was therefore described as not having "significant relevance" to their individual professional needs.

For district level professional development activities, the members of the study reported they "did not have any input" to the topic or manner in which the content was delivered to the staff, "it has been top down." Additionally they stated they were previously not asked to

participate in planning or executing the professional development activity. Following each professional development session, teachers were asked to provide feedback through a survey; however, they feel there their input "has not produced any change" in the delivery methods of large group professional development activities.

4.1.2 Departmental professional development

Several professional development days throughout the school year provide Department Chairs the opportunity to work directly with members of their department. These days are referred to as Curriculum and Direct Instruction (CADI) and provide teachers with an opportunity to collaborate and plan with members of their department. Although they are technically considered professional development days, they are often used as "work sessions" to review and evaluate the curriculum delivered to students. The topics and activities for these professional development days are prepared and delivered by Department Chairs who coordinate the activities with building principals and central office staff. Therefore, the participants indicated they “have very little input on the topics that are presented” to the entire staff. However, due to the nature of the sessions, participants feel they “have the ability to discuss a topic more deeply and more thoroughly and open up questions to other members of our department.” This feature has a direct impact on the level of collaboration that takes place during CADI sessions and was often reported as “more engaging” when compared to district level professional development. They described the CADI experience more as "work sessions" where tasks are being completed to serve the needs of the district and department.

4.1.3 Building level professional development

Building level professional development activities occur throughout the school year and allow building administrators to provide professional development activities to members of their building. The participants of the study agreed that these professional development days often embed instruction and assessment strategies that can be directly applied to the classroom. "Last year when we had the choice of activities to choose from, we were able to select activities that we wanted to learn more about, that was better, I liked that." Adding to the statement, another participant added, "I think that there has been lately the idea of choice which I think has been fantastic." The participants were referring to a professional development session that was designed to allow staff members to choose from a menu of technology topics. Teachers were provided the opportunity to focus on technology tools that supported instruction and assessment. Another participant added, "that was better, but it still didn't provide us with enough time to design lessons."

Traditionally, these sessions have been delivered in large group settings but provide more opportunities for teachers to break out into smaller groups where teachers can collaborate with their colleagues. The groups, however, change from one professional development activity to the next and there is not consistency. The group reported that they value the collaborative time with their colleagues and have greater opportunities to acquire new skills, especially with technology initiatives because it provides them with time to collaborate with other staff members and creates time for hands on learning. “We just need the time after we just learned something new to just to sit down by ourselves or with another person to make lessons that work in our classroom.”

All members of the study indicated they have previously been asked to present information to their colleagues in this setting. They indicated they were granted the opportunity to design the learning activities for their colleagues. "I've done a few. In terms of having input I think it was assigned." I verified the validity of this statement and recognized that topics were assigned to teachers to have them present to the remainder of the staff. During several professional development sessions, staff members were granted the opportunity to choose from a list of sessions that were of interest to them. This strategy had a positive impact on the group because they were granted the opportunity to choose an activity that aligned with their interests and needs. "The fact that we were given choice of the professional development activities was nice, it allowed us to choose a topic that we were interested in and one we thought we could handle with our students." Subsequently, the group perceived the activities to be "more relevant" to their professional needs. Although these activities were relevant and were delivered in small group settings, teachers struggled to implement the strategies in their classroom because they did not have ample time to deeply process the information and design lessons to implement the new strategies.

4.1.4 Individual professional development

Individual professional development activities are extended to teachers in a variety of ways. Teachers are able to use Networking Days to collaborate with other professionals during the school day on a topic they present and have approved by their building principal. Networking Days require teachers to sacrifice a day of instruction with their students to work with another professional. Three of the teachers involved in the study indicated they previously requested a Networking Day where they worked with one other teacher in their department teaching an

identical class. These days were viewed as highly relevant because they "get to design their own activity with another teacher" of their choice. Therefore, teachers had ownership of the topic and the activities to accomplish their plan. The teachers utilizing a Networking Day reported the sessions to be highly collaborative and provided time for reflection and questioning of professional practice by using phrases such as "giving each other feedback", "learn from other teachers", and "talk about how we deliver certain lessons." However, due to the design of the professional development activity, the teachers are responsible for planning and executing the activity. This creates a challenge for the teachers involved to carry out their daily responsibilities and plan for an effective experience. In addition, the teachers reported Networking Days are "difficult to use", as they require the teacher to "miss a day of instruction" with their students. The group elaborated that the district only makes a limited number of days available to staff members and the process of requesting a day can be cumbersome. Therefore, this mode of professional development cannot be used on a consistent basis throughout the school year and does not provide sustained professional development that leads to significant changes in their practice.

Members of the group also cited that summer workshops were available to teachers to enhance their technology skills and compared the design to be very similar to building level professional development activities where teachers had a choice of activities to attend. Currently these forms of professional development are valuable if a topic of interest is available.

4.1.5 Summary of activities

A major outcome of this study is to improve the manner in which professional development activities related to technology are delivered to staff members. Reflecting upon previous

professional development experiences was an important aspect of the study. This reflective exercise helped the participants formulate their own understanding of effective elements of professional development activities by analyzing their own experiences.

Teachers reported that they are generally not provided the opportunity to provide significant input on the topics that are presented to the entire staff. "We really haven't been asked about our opinion on the topics that are offered, we just show up and learn what it is." The lack of input had a direct relation on the feeling of relevance of the professional development activity. The group expressed major concern over the ability to work collaboratively with their colleagues over extended periods of time to learn from one another. "I think if we had the time to work with other teachers for longer periods of time, it would be much better and a better use of our time."

One member of the group summarized our professional development model using the same criticism often referenced in relation to curriculum, “our professional development model is a mile wide and an inch deep.” This statement resonated with other members of the group who summarized that we do not sustain our professional development topics and we continue to add more “tricks and gadgets to our repertoire, but don't take the time to get good at it.” The biggest challenge they expressed related is that the current model of professional development is that it does not provide ample time to collaborate with other teachers in the building over long periods of time.

The lack of time designated for teachers to refine their skills using technology to support instruction was a significant recognition for the PLC and assisted while designing the professional development activity. During our discussions, I learned from teachers that they are consistently given the opportunity to provide feedback on professional development activities;

however, they felt this data was not carefully reviewed or considered when designing future professional development activities. Therefore, PLCs benefit from engaging in reflective exercises to gain valuable information as they prepare to design professional development activities. In addition, their reflective practice found that very little professional development time is designated to collaborate with their colleagues to engage in deep reflective exercises where they are able to question their own practice and challenge ideas of others. I found the PLC valued the time they committed to reflecting upon previous professional development experiences.

4.2 IMPLEMENTING A PLC

As the leader of this professional development exercise, I used the research presented in Chapter 2 to train the participants on the effective attributes of a PLC. The building principal assumes a significant role while forming and implementing a PLC (DuFour et al., 2010). To ensure the success of the PLC I carefully planned activities so the participants had a clear understanding of how we would form our PLC.

4.2.1 PLC training

Prior to officially forming our Professional Learning Community (PLC), I provided the group with training on the attributes of effective PLCs. Historically, PLCs operated under a design that gathered teachers to discuss and focus on student achievement (DuFour, 2004). In Chapter 2, I stated that there is no singular definition of a PLC, and that it has been broadly defined as a

collaborative group of teachers who assemble to share their collective experiences from professional practice in a reflective manner over a sustained period of time with a goal of improving their practice while focusing on student learning (Mitchell & Sackney, 2000). The PLC in this study did not directly focus on student learning to a high degree, but focused their efforts on improving technology related professional development activities. While meeting with the participants of the study, I framed the definition of a PLC as "… a group of people who share a concern, a set of problems, or passion about a topic, who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger, Mcdermott, & Snyder, 2002). I used this definition because it more closely associated the purpose of forming our PLC to conduct the study.

We reflected upon this definition while relating it to the outcome of the study. The PLC recognized they shared a common vision to improve the manner in which we deliver professional development activities to staff members and were interested in building their own professional capacity to satisfy this objective. One participant stated, "we're here, we talked about our experiences with professional development and agreed that we [the school district] could do a better job" with professional development. The reflective exercise of focusing on the definition of a PLC solidified the reason for the strategic sampling of the members of the group. Another participant added, "We were picked to be a part of this study because of our passion for technology and how we use it in our classroom with our kids." The group recognized they were purposely selected to be a part of this study based upon their designation as high-level technology users in the building.

The forming of the PLC was based on the assumption that collectively we can make a difference in the school and that our actions can significantly improve teaching and learning.

The participants recognized the value of having members of the PLC from various content areas to learn from one another to design professional development activities that would be effective for all members of the staff. "In a normal school day, there would be no reason for me to meet with these people [referring to other members of the PLC] . . . getting us together is great." Another followed with, "what I like best about this is that we are actually doing something important for the whole building . . . so I think it's important to have members of different departments here, it makes sure we won't leave anybody out."

Providing a definition of the PLC and reflecting upon the purpose of the study was an important phase of the forming of the PLC and reinforced that the PLCs actions would not be futile but rather authentic, because the PLC was charged with the duty of how we manage the professional development time of nearly 100 professional staff members. Acknowledging this aspect of the formation of the PLC was important. Participants indicated their time was valued as we pursued the initiative to improve the professional development experiences for all staff members.

My presentation also highlighted attributes of effective PLCs that were present in the literature review. Five attributes of a successful PLC are referenced frequently throughout the literature. They include: shared values and vision; collective responsibility; reflective professional inquiry; collaboration; and group learning (Hord, 2009; Louis et al., 1994). As we reviewed these attributes of effective PLCs, the group recognized that we currently embraced a shared common vision to design effective professional development for staff members: "We share the value of using technology in the classroom, and I think we are all pretty much committed to helping to design better professional development activities, that seems like both."

To keep the meeting focused on the behaviors that aligned with the attributes of effective PLCs, I shared my draft of the standards under which we would operate (Appendix E). The participants indicated these standards aligned with a typical professional setting and agreed that they were appropriate. I welcomed any changes or modification to the standards. After further review of the nine standards, one member of the group wanted to add an additional statement that captured the "collective responsibility" attribute of a PLC that was specific for their group. The group was not opposed to adding a tenth statement and quickly agreed to the following standard, "We will remain focused on representing the needs of our colleagues." It was important to the PLC to articulate their commitment of improving professional development experiences for all teachers in the building.

We further discussed the effectiveness of PLCs found in the literature. While reviewing the information, one member noted how the literature directly aligned with what we had previously discussed in our first session regarding professional development. She specifically pointed to two bulleted items on the PowerPoint presentation that related to the impact PLCs have on teachers: "decreases isolation" and "increases morale." The group previously discussed how middle schools are designed with a team concept where teachers have more opportunity to collaborate with one another and share experiences on a daily basis. The high school model often supports isolation of teachers and does not support a collaborative environment during the regular workday: "we are all in our lanes and we don't know what other people are doing." The group recognized that having the opportunity to talk to others on a regular basis also increases morale in the building and focuses professionals on their true purpose of teaching our students. The interjection related to isolation and morale was significant as the PLC recognized that their findings and conclusions aligned with research conducted outside of our building.

In my reflection, I noted the importance of sharing summaries of literature with staff to validate a practice. I further noted this was an important part of the study that fostered more engagement of the PLC. They recognized that the process of organizing a PLC to examine professional development activities had value and potentially could influence the quality of instruction using technology. Going into the presentation, I did not feel that sharing a definition or set of standards would have as much impact as it did. At this time in the study, the group appeared to have a firm understanding of the attributes of effective PLCs and was ready to begin focusing their efforts on working together to design the professional development activity. To move forward in achieving this objective, we captured our direction by writing a SMART goal.

4.2.2 Establishing PLC goals

To assist the PLC in refining the goal, I provided the group with a short presentation of why goals are important and the specific elements of a SMART goal. SMART goals are Strategic and specific, Measurable, Attainable, Results oriented and Time bound. SMART goals can be used to focus members of a PLC on a task (Conzemius & O'Neill, 2009). To center the actions and results of the PLC it was useful to focus all members on a common goal. Using the introductory information as a guide, the PLC initially perceived their goal as "designing a professional development opportunity for our colleagues based on technology use."

While refining their initial goal, the PLC reflected upon the purpose of the study and our experience with previously conducted professional development activities related to technology. We discussed at length the shortcomings of the current professional development models and reflected upon our initial conversation as a group. We pointed to the major themes that were present during that discussion. The PLC summarized the shortcomings of our current

professional development model by not providing enough time for colleagues to acquire new learning in a collaborative environment where teachers can practice and reflect upon what they learned. Providing teachers with choice and latitude to deviate from activity to move into areas of interest was a desired trait to implement in our plan: "we need to give teachers time to work with other and learn from each other"; "we have a lot of experience in this room right now and there are a lot of other teachers out there who would benefit from something like this"; "giving people choice is really important too though." The previous professional development models provided training on multiple technology tools that were overwhelming to the group and did not provide opportunities for staff members to refine the skill(s) they were learning.

As a group we wanted our professional development activity to provide ample time for teachers to learn about new skills, collaborate with colleagues, and design lessons using the skills while sharing and learning from the experiences of others. We found it important to focus the professional development activity over longer periods of time so teachers could come back to an established group to share their experiences while implementing new strategies. The group thought this approach would narrow the focus of professional development while avoiding the criticism of being “a mile wide and an inch deep.”

The process of refining the goal reiterated the realization that their work in the PLC was authentic, meaning that the plan would actually be implemented and drive next year’s professional development model: "I'm really excited that we are actually being productive here and we are, at least I think we are, really going to use this next year." The recognition that their time, energy, and feedback was valued, served as a motivation to become more vested in the PLC. This recognition cultivated a true purpose for the PLC and engaged all members in the process.

After deliberating on the essential components of the professional development activity, the SMART goal was written in the final draft: “Design a sustained professional development plan for the 2018/2019 school year in order to enhance technology growth and foster peer collaboration where the staff feels that their time is valued.” The SMART goal along with the standards for the PLC was kept in sight for all future work sessions. One strength of forming this PLC rested upon the group of teachers recognizing that they had a voice to change professional development activities for the better and that their time committed to the project was valued.

4.2.3 Designing professional development in a PLC

To prepare to design professional development activities for their colleagues, the PLC decided to increase our knowledge of professional development strategies to improve technology integration by researching professional journal articles. The PLC researched and found four articles that were aligned with the SMART goal. The bibliographies of these articles are listed in Appendix F.

After reading the articles, the PLC reassembled and shared their major takeaways from the readings that were applicable to the study. The group specifically discussed the indicators presented in the articles that identified key factors that contribute to effective professional development to increase technology integration. The PLC reached consensus on the following factors that we agreed to incorporate when developing our professional development activity.

- The professional development activity must improve teacher knowledge. (Unger & Tracey, 2013)
- The professional development activity must create engaging teacher centered training. (Curwood, 2013)

- The professional development must be sustained and content focused over time. (Chikasanda, Otrel-Cass, Williams, & Jones, 2013; Curwood, 2013)
- Teachers must have time to present and share their knowledge to colleagues. (Liu, Tsai, & Huang, 2015; Unger & Tracey, 2013)
- The professional development activity must value teachers' knowledge and experience. (Chikasanda et al., 2013; Curwood, 2013)
- Teachers must be immersed in a collaborative professional development setting. (Liu et al., 2015; Unger & Tracey, 2013)
- Teachers must have the opportunity to observe other teachers implementing technology. (Liu et al., 2015)
- Teachers must have the opportunity to receive hands on training. (Liu et al., 2015)
- Teachers must have access to an expert in the field and have administrative support. (Unger & Tracey, 2013)

To ensure that these key elements of professional development were integrated into the professional development activity, I printed and posted the bullet points for the remainder of the sessions. In addition to these bulleted items, the PLC also wanted to ensure that teachers had a variety of options to choose when entering into the professional development activity.

The PLC then focused their efforts on creating a sustained professional development plan that would span across the entire 2018/2019 school year. With their recent experience of working in a PLC to design professional development activities, we decided to follow a similar model when offering professional development to the entire staff. "What we're doing right now would be great for the rest of the staff, working together to learn about technology." Another participant added, "I agree, I learned a lot just listening to how everyone else uses the same tool I use in my classroom." Staff members would be divided into a PLC of no more than six participants in each group. Debate ensued as to whether or not teachers could pick the members of their group. Some members thought there would be value in allowing teachers to pick their group so they could work with members of their department, while others argued the strength of the current PLC rested with the diversity of the group. To assist us in making the decision we

reviewed our list of essential factors of the professional development activity along with the SMART goal (Design a professional development plan for the 2018/2019 school year in order to enhance technology growth and foster peer collaboration where the staff feels that their time is valued). The PLC further debated and agreed that in order to foster peer collaboration throughout the building, staff members would be assigned to a PLC.

During this phase of the study, teachers shared and reflected upon their professional experiences with technology in the classroom and developed a list of effective strategies they used in their classroom. As each member shared their experiences, other members of the group asked questions to gain a better understanding of how the strategy impacted student learning. Teachers wanted to know information such as, “How easy is it to use?”; “Are you able to run reports on each student?”; “What do the students learn from using it?”; “How often do you use it?”; “What information do you get from the students?”; and “Why do students like it?” At the conclusion of the session, the group generated a list eighteen technology tools that were used on a regular basis in their classrooms.

As the group reported out they began to recognize that the tools were naturally falling into distinct categories. The full list was reviewed and the group used the following categories to place the web tools and applications:

- Audio & Video Creations
- Collaboration
- Flipped Learning
- Formative Assessment
- Presentation

To balance the categories, the PLC researched additional web tools and applications that associated with the established categories. The Technology Integrator shared her area of expertise with the group by providing the group with additional web tools and applications to

consider for each category. As she listed additional tools for each category, group members recognized the names of several tools and stated they were unfamiliar with others. Prior to the next session, group members examined the additional tools by exploring the capabilities to determine if they should be included on their list. Three of the teachers used additional tools with their students to collect additional data on the effectiveness of the tool. At our next session, the group finalized the web tools and applications to be included in each of the categories. Many of the web tools and applications were previously shared with teachers in the past; however, based on feedback the PLC received from other staff members and their own personal reflection, a lack of "time", "practice", and "collaboration" stifled the implementation of the tools into classroom practice.

Once we determined the categories, the group began working on the details of how teachers would be introduced to the professional development activity. During an opening day professional development session, each of the categories will be presented to the staff along with a brief demonstration of several web tools and applications under each category. Teachers will then pick one of the five categories to invest an entire school year to work in a PLC along with their colleagues. In addition, they will receive professional development on the attributes of effective PLCs to guide staff members through the process. To further support teachers, each web tool has intuitive tutoring built into the site to support the development of instructional activities. If a group experiences difficulty using the web tools or applications, they can call upon members of the faculty who will serve as experts in the filed for each category. PLCs will have the opportunity to schedule time with the expert to support their learning.

As teachers work in their PLCs, they will need to maintain a set of artifacts that document their individual growth. Extensive time will be provided to PLCs by dedicating all

four building-based professional development days throughout the school year. Time generally committed for faculty meetings will also be used for PLCs to assemble and meet every other month throughout the year. At the final professional development session in May, PLCs with common categories will meet and share their learning with other staff members with common interests.

4.3 FINDINGS FROM THE EXIT INTERVIEWS

Through the exit interviews each of the participants indicated they learned about professional development and enhanced their knowledge of using technology in the classroom. One influential aspect of the PLC that had a direct impact on the success of the PLC was the composition of the group. All members of the group indicated "the size of the group" either "contributed" or had "a significant impact" on the supportive nature of the group. Because of the size of our PLC, members indicated they were able to effectively contribute "without having a member dominate" the interactions and intended outcome. Three of the members specifically noted that the size of the group created an environment where they "felt comfortable sharing" their experiences as it related to professional development and using technology in the classroom. One participant contrasted their experience with larger group settings where it is often "easier to blend in" and not engage. The small group setting also contributed to members taking ownership of their decisions.

The diversity of the group was also viewed as effective towards reaching the goal of designing professional development activities for colleagues. Four members indicated they seldom have the opportunity to work closely with members outside their department: "I usually

stay in my lane"; "we are so isolated here at the high school"; "we are very departmentalized"; and "I'm lucky if I get to sit down with members of my own department." They found value in learning and sharing their experiences with a group of teachers from different departments. Five of the six members mentioned the diversity of the group provided the PLC the opportunity to learn of different perspectives and approaches to integrating technology into instructional lessons. These members thought this was important when designing professional development activities for the entire staff and solidified their belief that the professional development activity they planned for their colleagues should incorporate a diversified membership.

Three of the six members indicated they did not have a strong professional relationship with the other members of the group prior to the study. This dynamic, however, did not have an adverse impact on their willingness to engage in collaboration. "We're all in the same building, we all work with the same kids, we're all on the same team, we want to be our best." Because the composition of the group included members of the staff, they felt safe to engage. As a result of being involved in the PLC, they indicated they were more inclined to seek out members of the team for assistance or to share ideas about technology outside the group setting: "Just by being in this group, I've already worked with Terry to learn more about Nearpod, I thought I had a pretty good understanding of it, but I was able to learn more."

4.3.1 Professionally valued

A major finding in the data revealed that participants in the study felt professionally valued while contributing to the PLC. In the past, staff members were asked their opinion or asked to provide feedback, but rarely had the opportunity to be directly involved with significant decisions in regard to professional development. By participating in this study, they felt their opinions and

feedback truly mattered and had a direct impact on the planning for upcoming professional development activities. "I think the value was that we were all able to work together on designing our plan, and one the biggest pieces was that you listened and trusted us." Another participant described it by saying, “my involvement in the PLC will motivate me to make sure our plan is successful . . .I feel that because I helped design the activity, I am responsible for making sure it works.”

4.3.2 Participating in an authentic activity

Related to this finding were statements summarizing their involvement in an authentic activity. All six of the participants stated that being a part of an activity that used their professional opinions to implement change motivated them to invest their time in the PLC. "This was a great use of our time, that's what kept me going"; "I was excited when you said we were actually going to do this"; "This is real, and it's real important"; "change isn't easy but when you go about it the right way it can fun"; "I think what motivated me the most was this was authentic, something we took time to investigate"; and "you told us you were going to listen and that's what kept me going." At the onset of the study, I made it clear that I wanted the outcome of the PLC to result in a professional development activity that would be used with our staff. Participating in the PLC gave them a sense of ownership to successfully plan for an upcoming professional development activity.

4.3.3 Group learning

An appealing aspect of the PLC was that members enjoyed participating in the PLC because it provided them an opportunity to reflect upon their own teaching while listening to others' views on technology tools. Two of the participants made the direct connection that learning from others who work with students from the same school was viewed as more trustworthy and reliable. One stated, "You hear how other schools do things, but I feel a lot more comfortable hearing from teachers in our building." and the other stated, "when you work with teachers in your same building, it's easier to share information with each other and you get the feeling that if it works for them, it will work for me . . . I think we respect each other"

The participants also appreciated the advanced planning and reflective exercises prior to determining the professional development activity. The participants used the followed words to describe the attributes that made the PLC effective: "advanced planning"; "organization"; and "preparation." The group indicated reflecting upon their prior experience with professional development was a critical aspect of the PLC that made completing the task easier and contributed to a solid plan. Another aspect of the PLC that the group valued was the writing the SMART Goal. The writing of the SAMRT goal forced the PLC to truly examine the task they were charged to fulfill and organized their efforts moving forward in the activity. "You hear about the value of writing goals but we really don't practice that much . . .the process of writing the goal helped us stay focused on what we wanted to get done."

Group members were surprised by the number of tools the group developed in a short period of time but provided reason to why some teachers may fell overwhelmed by the number of tools that can virtually do the same thing. This validated their approach and design of the

professional development activity to give teachers time to truly invest in learning about the tool and having the opportunity to share their experience with others.

4.4 SUMMARY

Providing a framework of the PLC at the onset of the study created an environment where all members of the PLC clearly understood the expectations of the final outcome and standards under which the team would function. Providing this framework helped the group narrow their focus by writing a SMART goal.

The reflective exercises related to professional development created a collaborative environment where the PLC processed their understanding of effective characteristics of professional development. This further led to professional inquiry where the PLC researched the literature to validate their perceptions and expand their knowledge. The group used their professional experience, knowledge they acquired from reviewing literature, and experience in working in a PLC to design their professional development activity for their colleagues. Similarly, the group's reflection and collaboration of effective technology tools used in the classroom enticed them to examine their own practice of using technology in the classroom while learning from others while they described their experiences. Again, the combination of reflection and collaboration resulted in professional inquiry to learn of additional tools that can support learning in the classroom.

Professional development activities implementing a PLC to design professional development activities created an environment where teachers felt their professional expertise was valued. This setting further created a bond among the members where they trusted each

other's experiences because they had the opportunity to question the value of using technology tools to support instruction. Through my self-reflection, assembling a PLC to design professional development activities creates an opportunity to collect data on the effectiveness of professional development activities. Although I regularly read the feedback that was proved through surveys, the information was anonymous and I did not have the opportunity to dig into the data deeper.

The next chapter will summarize the major findings of the study and assign meaning to them. Although this study collected findings from a specific Professional Learning Community, I believe the meanings associated with the findings can be valuable to a broader audience when considering the use of a PLC to design professional development activities.

5.0 INTERPRETATIONS AND MEANINGS

This chapter will review the major findings from the study and extract meaning as they relate to each of the research questions. As the chapter unfolds, I make connections among the data gathered to add greater value to the study. The first research question focused on how a group of teachers work with their building principal to form a PLC to share their knowledge and expertise. The second question focused on how a PLC can design professional development activities and the third question sought to determine the perceptions of the PLC regarding the effectiveness of using the PLC for learning and planning. I begin by summarizing the major findings in relationship to question one.

5.1 RESEARCH QUESTION 1

The first research question (How do secondary teachers who are high level technology users form a Professional Learning Community to share their knowledge and expertise?) was designed to broadly determine the impact of the role I played while designing steps to form the PLC and how the participants responded to the training. The data associated with this question were collected toward the beginning and end of the study and were captured through observation, field notes, self-reflection and semi-structured interviews. I reflected upon my role as the building principal to organize the PLC using the attributes found in the literature for effective PLCs.

Table 1 summarizes the methods used to collect the targeted evidence and provides citations of literature that was used when triangulating the data.

Table 1. Evidence, literature, and methods to collect data for Research Question 1

Research Question	Evidence	Literature	Method
RQ1: How do secondary teachers who are high level technology users form a Professional Learning Community to share their knowledge and expertise?	- Steps to plan for PLC implementation - Principal's communication of procedures - Activities designed to prepare the participants - Reaction of participants to the framework	- Bolam et al., 2005 - Darling-Hammond & McLaughlin, 1995 - DuFour et al., 2010 - DuFour & Marzano, 2011 - Supovitz, 2002	- Observation - Field Notes - Self Reflective Journal

5.1.1 The role of the principal

One finding was directly related to the importance of the planning and preparation phase conducted prior to forming the PLC. As the primary designer of professional development activities at the building level, the principal adopts a critical role while forming and implementing a PLC (DuFour et al., 2010). This finding creates meaning when determining how secondary teachers who are high level technology users form a PLC to share their knowledge and expertise. The thought and focus to detail while planning to assemble the group had a direct impact on the success of the group reaching its goal to design professional development activities for their colleagues. Aspects of the literature I used to form and implement the PLC were related to the size of the group, creating a culture of shared decision making, and engaging in reflective collaboration to promote group learning. Professional development activities must be well planned to create an environment where teachers can reflect upon their professional experiences through collaboration and professional inquiry (Darling-Hammond & McLaughlin, 1995).

The composition of the group, defining the attributes of a PLC, and communicating the expectations for the group had many direct benefits and were recorded while taking field notes, personal reflections, and conducting post semi-structured interviews. The following two sections review these findings and create new meaning when a PLC is used to develop professional development activities.

5.1.2 Composition of the group

The members of the PLC were strategically selected prior to the study. I included an English, math, science, social studies, and world language teacher along with our Technology Integrator to be a part of the PLC to create a diverse team. Although the participants were diverse using this design, they were also selected based upon their skill level with technology in the classroom. As the PLC formed, the group recognized their common passion for using technology in the classroom to support instruction. Shared values are an important characteristic of effective PLCs and is found throughout the literature (DuFour et al., 2010; Hord, 1997; Louis et al., 1994). This acknowledgement created a bond that contributed to the trust and respect they had for each other's appreciation of the value of using technology in the classroom to support instruction.

The diversity of the group also helped members conceptualize the previous professional development activities experienced by members of other departments in the building through reflection and collaboration. Prior to engaging in critical reflection, members of a group must form a level of trust with one another (Bolam et al., 2005). It further allowed the PLC to gain insight into what outcomes other members valued and desired through participating in professional development activities. The reflective exercises enhanced the participants' understanding of the complexities of professional development through multiple perspectives of

the issue. This contributed to the group gaining a shared vision for the professional development needs of their colleagues. Therefore, when planning to assemble a PLC to design professional development activities, it is an effective characteristic to have a diversified sampling of the faculty who share a common value in the area the professional development activity is designed to improve.

My findings presented in Chapter 4 also outlined the significance the size of the group had on the PLC's ability to effectively collaborate with one another while reflecting on previous experiences and designing the professional development activity. Small groups assist in creating an environment where teachers are able to build positive relationships with one another and collaborate more effectively (Supovitz, 2002). The smaller setting contributed to the group being able to provide input on their experiences with both professional development and technology usage in the classroom. This finding contrasted the participants' reflection of their ability to provide input and collaborate during previous professional development activities where the size of the group was large. The large group setting created distractions that prohibited members from fully engaging in the professional development activities and did not support a collaborative environment to foster growth. Traditional professional development activities assemble large groups of teachers (Phillips, 2003). In a small group setting, teachers are able to effectively collaborate with one another while reflecting upon previous experiences and planning for future professional development activities.

While providing input, members of the PLC felt safe sharing their experiences and had the opportunity to express a rationale for their feelings. While it is important for an instructional leader to understand the needs of the entire staff (DuFour, 2004), when making decisions the size of the group has an impact on making progress. Therefore, when using a PLC to design

professional development activities it is important to engage a manageable number of teachers where all voices can be heard and each member has the opportunity to provide input.

5.1.3 Communicating expectations of a PLC

As the PLC began to form and shared their knowledge and expertise, they relied upon me as the instructional leader to communicate the expectations of the PLC. To convey the expectations for the group, I shared the definition and common attributes of a PLC, along with the standards under which we would conduct our sessions. While forming a PLC it is recommended for an instructional leader to define the conditions under which a PLC will operate and make decisions (DuFour et al., 2010). The definition used for this study was presented to the participants as "a group of people who share a common concern, a set of problems, or passion about a topic, who deepen their knowledge and expertise in this area by interacting on an ongoing basis."

Shortly after I shared these three elements (definition, standards, and attributes), ownership of the PLC began to transition to the participants as they recognized their professional expertise made considerable contributions. The participants had a clear understanding of the framework for how we would operate and how decisions would be made. They felt comfortable moving through the process and sharing their basic and profound knowledge related to professional development and technology integration in the classroom. They further recognized the framework of the study valued their input and contributed to improving the conditions of professional development.

While forming a PLC to design professional development activities, it is essential to recognize the expectations for the group and establish a process for making decisions. At the onset of initiating a PLC, the principal must make clear the expectations of the group.

Establishing a set of standards for interaction and decision-making assists with making this clear to all members (DuFour et al., 2010). Therefore, careful consideration while designing the framework and communicating the expectations to the group prior to officially forming a PLC has an impact on the success of the initiative and the PLC reaching their goal.

I further believe it is important to recognize a key finding during this phase of the study as it creates additional meaning to sharing research with teachers. While learning of the definition and key attributes of effective PLCs, participants made connections between research in the area of PLCs and their own experiences and behaviors. It is important to highlight this finding as it indicates that when teachers see that research aligns with their experiences they are more likely to trust the research and look towards it to assist in areas that are unfamiliar. A joking but relevant statement by one of the participants, “not all research is bogus,” indicates that when teachers see the value of research they trust the research to conduct independent research on their own.

In our case, the research related to the attributes of the PLC garnered trust in the group to conduct further research later in the study about the elements of effective professional development to incorporate into our plan. It is important to share relevant research with teachers that align with their experiences and consistently embed the research into practice. Research indicates we should engage in sustained professional development activities over periods of time and engage staff members in meaningful activities (Darling-Hammond & McLaughlin, 1995), however, in the group's findings regarding professional development, we as a building drifted away from that practice which contributed to unsuccessful experiences that did not have a direct impact on instruction.

The participants used their professional experience with current and past models of professional development combined with research in the field that outlined effective elements of professional development in technology. The process involved in forming the PLC had an impact on the success experienced by the PLC and created an opportunity for me to transfer ownership of the PLC to the participants of the group.

5.2 RESEARCH QUESTION 2

The second research question (How can a Professional Learning Community design a professional development plan for colleagues related to using technology to support instruction?) examined the process and procedures of the PLC while designing customized professional development activities. Professional development plays an important role when implementing change and acquiring new skills (Bishop, Berryman, Wearmouth, Peter, & Clapham, 2012) and served as the main responsibility of the PLC in this study. The PLC reflected upon prior professional development sessions by participating in the initial group discussion and was captured during collaborative exercises embedded in the study. The group discussion and semi-structured interviews were audio recorded and transcribed immediately following the session. The group also engaged in reflective professional inquiry regarding their perceptions, knowledge and skill level to use technology to support classroom instruction. The PLC used the data they collected to design professional development activities that increased their individual and group capacity to design professional development activities for their colleagues.

This question and phase of the research, once again, required me to actively participate in the study to facilitate discussion and provide resources. All participants, including myself,

collectively reviewed the PLC's needs to determine the professional development activities that best met the needs of each participant. Work sessions provided time for the group to learn about effective elements of professional development and acquire new knowledge related to the use of technology while designing the professional development activities. During this phase of the study, I conducted observations, recorded field notes, and reflected upon my own learning in the process. In addition, a personal reflective journal was maintained at the completion of each work session to record and reflect upon my own learning and how the PLC interacted and processed new information. Table 2 summarizes the methods used to collect the targeted evidence and provides citations of literature that was used when triangulating the data.

Table 2. Evidence, literature, and methods to collect data for Research Question 2

Research Question	Evidence	Literature	Method
RQ 2: How can a Professional Learning Community design a professional development plan for colleagues related to using technology to support instruction?	- Identification of professional development needs - Seeking knowledge from external sources - Collaboration among participants - Group and individual learning - Active engagement - Delegation of duties and collective responsibility - Professional development activities focusing on technology	- Conzemius & O'Neill, 2009 - Hord, 1997 - DuFour et al., 2010 - Russell, 2006 - Servage, 2008 - Wieringa, 2011	- Field notes - Observation - Semi structured interviews - Group discussions

5.2.1 Transitioning ownership

The transition of ownership was a key finding in the study. When teachers recognize that their time, energy, knowledge, and experience is valued it reaffirms that their actions can have an influence on change and they become more vested in the process (Englert & Tarrant, 1995; Supovitz, 2002). After reviewing the expectations for the PLC, ownership began to naturally

transition to a shared ownership between the PLC and me. This transition was first noted while covering the Standards of the PLC (Appendix E) and asking the group if they had any revisions or additions. A set of nine standards shared with the group prior to officially forming the PLC was expanded to ten after the group wanted to express their commitment to the staff by adding, "We will remain focused on representing the needs of our colleagues." The transition of ownership did not rest with sharing expectations and soliciting input on the Standards of the PLC, I further transitioned ownership of the PLC to the group by leading them in a discussion regarding the value of writing SMART goals.

5.2.2 Importance of writing a SMART goal

This study confirmed that SMART goals are useful in focusing a PLC on a given task and grants the latitude to make decisions on specifically what will be accomplished while the PLC is operating. Goals that are Strategic and specific, Measurable, Attainable, Results oriented, and Time bound help organizations focus their actions and decisions (Conzemius & O'Neill, 2009). This study further found that the process of writing a SMART goal in a collective manner provides empowerment to the group to base their future decisions on a collective goal. When decisions are made collectively, teachers are more enthusiastic and better prepared to institute change initiatives (Servage, 2008). The PLC kept their SMART goal posted throughout the study and referred back to it on occasion when the group needed to refocus their decisions. When latitude in making decisions is granted to a group of teachers, they recognize that the end result for the activity has not been predetermined but was the product of their investment in the PLC. Providing teachers with the latitude to make decisions using a collective goal as a framework creates an environment where teacher feel professionally valued.

Furthermore, the time dedicated to this phase of the study helped the participants understand why they were gathered and focused their purpose. Learning theories indicate that in order for adults to engage in the learning process, they must recognize the reason for which the learning is important (Russell, 2006). The participants made this connection by identifying that they were all teachers who valued the use of technology in the classroom and that the current structure of professional development was not maximizing the use of time to meet the needs of the entire staff. Through the context of the information shared prior to the PLC forming they further recognized they shared a common concern to improve the current condition of professional development activities. The relevance of an activity that aligns with shared vision and values engages teachers to participate more deeply in pursuit of improving a condition such as professional development. When members of a PLC recognize the relevance and the importance of a task they are more inclined to engage. The transfer of ownership through sharing the expectations and writing a SMART goal led to a PLC that was notably more engaged in the process of designing professional development plans for their colleagues.

5.2.3 Designing professional development

Professional development sessions are often criticized for their singular nature, meaning the activity is presented in a single session and not revisited in the future to further develop the skill (Phillips, 2003). Presenting professional development activities using this approach can often have unintended results such as encouraging teachers to work in isolation as opposed to fostering a collaborative environment (DuFour, 2004). When professional development lacks necessary connections and relevance to classroom instruction, the results tend to be futile by having no significant impact or relevance on teaching and learning and often results in lack of engagement

(Darling-Hammond & McLaughlin, 1995). In order to plan professional development activities, the PLC found value in reflecting upon their previous experiences, collaborating about effective and ineffective elements, and conducting their own inquiry on how to improve the condition of professional development.

5.2.4 Reflection

The differences that stimulate adults to learn are their level of motivation, their prior experience with the topic being taught, their level of engagement in the learning exercise, and the manner in which they value the application of the new skill (Russell, 2006). In the field of education, teachers acquire a wealth of experience through their daily interactions with students and curriculum. Collaboration among teachers to engage in reflective dialog that advances and refines their practice can have positive outcomes (Wieringa, 2011). This finding suggests and was substantiated by this study that professional learning can occur as the result of professionals' collective ability to reflect upon their actions in the classroom.

Reflection had a significant impact on designing the professional development activity outlined in the study. During the reflective exercises, the PLC examined in detail their experiences with professional development by discussing their involvement in planning and delivering activities as well as sharing their experiences. This reflection empowered the PLC to determine the strengths and weaknesses of previously experienced professional development exercises. The group created their own meaning and purpose of professional development and the impact it can have on instruction and learning. This further created new knowledge related to the importance of effective professional development activities by pressing the group to find additional information about professional development through conducting their own research.

This research produced a list of elements that they wanted to include in the professional development activity. Guiding teachers in reflective exercises that focus on improving professional development activities provides instructional leaders with valuable information when designing future activities.

The design of the PLC creates an environment where teachers can reflect upon their own experiences while challenging other to think more critically on their practice in a supportive environment (Servage, 2008). Reflection was also valuable when teachers reflected on their own practice in the classroom using technology. The participants shared specific technology tools they incorporated in their lessons and noted the impact it had on student learning. These reflections led to professional inquiry and collaboration among the participants and were evident by asking each other about how students reacted to lessons involving technology. They further pressed each other for new knowledge on how the data extracted from the lesson had an impact on learning and future activities. Therefore, reflection conducted in a collaborative manner helps teachers understand the impact technology has on instructional lessons and encourages other teachers to inquire about the practice while creating new knowledge. These reflective exercises on classroom experience with technology impact how PLCs design professional development activities for their colleagues.

In order to design technology professional development activities, it is essential for a PLC to reflect upon the prior experience. Reflective exercises in a collaborative environment can identify strengths and areas for improvement in professional development and create a framework for how PLCs design professional development activities.

5.2.5 Collaboration

A collaborative environment in a PLC, fused with self-reflection, can have a significant impact on student learning (DuFour, et al., 2010). The collaborative nature of the PLC assembled for this study had a direct impact on members' ability to process information gathered through their reflective exercises with technology and professional development. As members reflected upon their experiences, the collaborative element refined their knowledge and encouraged a desire to acquire more information about technology and professional development. Classrooms are abounding with authentic data. In a collaborative setting, these data can be analyzed and foster professional inquiry (Dewey, 1929). With the abundance of authentic classroom data assembled in the field, teachers must have the opportunity to apply their experiences, knowledge, and skills to expand their capacity in the classroom (Cox, 2015).

The collaborative model created an environment where teachers were able to deeply examine how technology is used in classrooms to support instruction. The group generated a list of web tools and applications that, based on their professional experience, had a positive impact on learning in their classroom. This encouraged the group to research and categorize additional tools that others teachers in the building could incorporate into lessons. Engaging teachers in collaborative exercises focusing on technology enhances their understanding of the tools and provides them with the skills to design professional development activities for others.

In relation to the collaborative environment to process information about technology tools, the group collaborated on aspects of technology that were effective for classroom learning activities. These collaborative efforts fostered a deeper understanding of how technology is used in the classroom to support instruction. By engaging in collaboration in a PLC, teachers are able

to expand on their profound knowledge related to teaching and learning. This process builds the professional capacity of the participants to more effectively use technology in the classroom.

In regard to professional development, the collaborative environment of the PLC fostered an ambition to engage in professional inquiry. Our group reflected upon our professional development and collaborated on how this condition could be improved. This led the participants to conduct research on professional development by searching for effective characteristics of professional development activities. By conducting our own research, we assembled a list of nine essential characteristics that we wanted to preserve in our professional development activity. To further their knowledge in the field, teachers must have the opportunity to collaborate and engage in professional inquiry. This process creates the opportunity for teachers to extend and refine their knowledge. Thus, collaboration in an environment where members feel safe to share their feelings and experiences can lead to further questions. The collaborative environment in a PLC used to design professional development activities encourages members to find deeper meaning through professional inquiry.

Collaborative environments that provide supports for adults to engage in reflection and professional inquiry engenders behaviors that align with adult learning theories such as self-directed learning and motivation to acquire new knowledge. When professional development exercises embed attributes of adult learning styles the activity is more likely to implement the new initiative (Trotter, 2006). Administrators must therefore strive to make connections between professional development exercises and classroom instruction so that teachers can rely upon their professional knowledge to apply the new skill being introduced. This type of teacher collaboration, occurring outside the classroom among staff members, can have a significant

impact on student learning and the overall professional culture of the building (Louis et al., 1994).

5.3 RESEARCH QUESTION 3

The third research question (What are the perceptions of PLC members regarding the effectiveness of using a PLC for learning and planning?) was designed to compare and contrast the experience of participating in a PLC versus traditional models of professional development activities previously experienced. The quality and frequency of the professional development can have a significant impact on the success of transitioning from traditional teaching to technology assisted teaching (Niederhauser & Wessling, 2011). Semi-structured interviews on an individual basis allowed the participants to share and reflect upon their newly acquired learning and their perceptions of using the PLC for learning and planning. Theses semi-structured interviews were audio recorded and transcribed immediately following the session.

Questions two and three used group discussions and semi-structured interviews to collect data. The group discussion was conducted first prior to officially forming the PLC. The semi-structured interview was conducted on an individual basis to allow the participant to fully explain their individual experience. The combination of the group discussion and semi-structured interviews captured data related to these questions and were used to assist in triangulating the data as described in a later section. Table 3 summarizes the methods used to collect the targeted evidence and provides citations of literature that was used when triangulating the data.

Table 3. Evidence, literature, and methods to collect data for Research Question 3

Research Question	Evidence	Literature	Method
RQ 3: What are the perceptions of PLC members regarding the effectiveness of using a PLC for learning and planning?	- Participation in group discussion. - Self-reflection of current practice. - Processing new information acquired from colleagues. - Engage in professional discourse with colleagues. - Active listening to colleagues. - Challenge beliefs: self and others. - Share ideas and experiences.	- DuFour et al., 2010 - Englert & Tarrant, 1995 - Hord, 1997 - Louis et al., 1994 - Strahan, 2003 - Supovitz, 2002 - Trotter, 2006	- Self Reflective Journal - Observation - Field notes - Semi-structured interviews - Group discussions

5.3.1 Engaging a PLC

Throughout the literature there are a variety of components that make professional development a rewarding and valuable experience for teachers. Some of these components can be achieved by making professional development sessions engaging, reflective, collaborative, sustained, and grounded in inquiry (Darling-Hammond & McLaughlin, 1995). These characteristics were not consistently used by the participants to describe the previous professional development activities used to foster growth in technology. Data recorded during the study, however, demonstrated the use of a PLC to design professional development activities embraced these characteristics. Consequently the participants reported their experience added value to their professional capacity by participating in a PLC that was designed to develop professional development activities.

5.3.2 Authentic activity

Adult learners thrive in authentic learning activities (Trotter, 2006). Several participants commented throughout the study that they were excited to have the opportunity to provide input on improving professional development activities. This excitement translated into active engagement in the PLC. They further recognized their professional input was having an impact on the development of a new activity and this feeling translated into feeling respected. When teachers realize their professional experiences are valued by their principal, they feel safe to engage more deeply and share their beliefs more openly (Strahan, 2003). Therefore, when teacher insight is collected and valued by an instructional leader through an authentic activity, teachers are more inclined to engage.

Data collected in this area were very strong and were present throughout the study. The group of teachers felt respected by sharing their experiences in a PLC where the purpose was to implement change. Statements such as “are we really going to do this”; “the teachers are going to love this”; and “this will really use our time wisely” were all captured during the study with the recognition that the PLC was working on a project that was actually going to be implemented. The presence of this excitement was recorded in exit interviews, my personal reflections, as well by recognizing that the time they spent in the PLC was “one of the best professional development sessions I ever participated in.” Teachers, therefore feel valued and appreciated when they are given the opportunity to participate in authentic activities that foster change and improvement.

In addition to being authentic, the PLC shared a valued of incorporating technology into instruction. The PLC focused their energy on developing a professional development activity directly related to this common value. Therefore, the teachers found the activity relevant

towards their professional needs. This aspect of the relevance also recorded an impact on their engagement levels. Therefore, a PLC used to create professional development activities in an area that is relevant to the needs of the staff leads to a PLC that is more engaged in the process.

After forming the PLC, the participants recognized there was not a predetermined method to achieve the goal the group had established. By providing the group with latitude to conduct their own research, share their own professional experiences, and draw their own conclusions on what constitutes effective elements of professional development, the group was engaged in the process. This indicates a PLC that provides staff members with opportunities to make their own decisions has a positive impact on how the group designs professional development activities for their colleagues.

5.4 BENEFITS OF A PLC TO DESIGN PROFESSIONAL DEVELOPMENT

Using a PLC to design professional development activities has a variety of benefits that are similar in nature to using a PLC for traditional purposes of examining student performance. A PLC formed with this purpose motivates a group of teachers to improve the manner in which professional development is delivered to teachers. Quality professional development can have a positive impact on student learning (Darling-Hammond & McLaughlin, 1995; Garet et al., 2001; Harris & Sass, 2011). Therefore when a focus is placed on improving the quality of professional development activities it can translate into improving the skills of teacher to be more effective in the classroom.

Teachers recognize that their performance in the classroom has an impact on student performance. When they are charged with an authentic task such as improving professional

development activities it increases their desire to acquire more information about a particular subject such as technology. This distribution of decision-making empowers teachers to make decisions in unison with the building leader. Therefore, PLCs formed to design professional development plans have the potential to unite a selective group of professionals in school improvement initiatives. When charged with the duty of designing professional development activities for others, teachers must become an expert in the field. This acquisition of new knowledge serves a dual purpose of creating professional development activities and increasing the capacity of staff members that influences student learning.

Throughout the process of forming and working in a PLC to design professional development activities, teachers form trusting relationships with each other and encourages them to seek assistance from others in a high school setting that can often be isolated and departmentalized. A PLC used to design professional development activities places the ownership of organizational capacity and growth on teachers through collective responsibility. If the plans designed for professional development are not effective for teachers, then the PLC will feel accountable. If, however, the professional development activities are successful the group will feel gratified.

5.5 SUMMARY

The growth of the presence of technology in classrooms across the United States has caused administrators to focus their attention on designing quality professional development activities for teacher to increase their effectiveness in the classroom. To improve the current conditions of professional development models, it is important to have teachers engage in reflective exercises

that promote collaboration among colleagues. One way to design professional development activities for teacher is to assemble a PLC to examine the effectiveness of current professional development activities and to learn strategies to incorporate technology in the classroom. By assembling a manageable group of teachers who are high-level technology users, members of a PLC are able to collaboratively engage in reflective exercises that increase their knowledge of technology and professional development. The small selective sampling of staff members creates an environment where teachers build trust by learning from the experiences of others to refine their own understanding of technology while designing professional development plans for their colleagues. In the process of forming the group, instructional leaders must recognize that diversified membership will assist in designing activities that are relevant for the entire staff. While working within the parameters of a PLC, members are able to build trust with one another and share ideas in safe environment where all ideas will be accepted.

Prior to assembling the PLC, instructional leaders must carefully plan to prepare the group for the expectations of the PLC by focusing on process such as standards of operation and focusing on the outcome by incorporating a goal (DuFour, 2004). Furthermore, instructional leaders should strongly consider methods to transition ownership of the PLC to a shared model of decision-making where teachers' professional experiences are valued. The shared ownership of the group motivates the members of the PLC to engage at higher levels when compared to traditional professional development activities and increases their vested interest in an effective and productive final result. When shared decision-making is intact, the PLC is provided with latitude to make decisions that impact the professional development experiences for their colleagues. When decisions are made as a team and teachers guide their own learning, they are more enthusiastic and prepared to implement new initiatives in the building (Servage, 2008).

Reflection and collaboration are vital elements to encourage teachers in a PLC to examine their professional practice and share experiences with others to foster individual and collective growth. When a collaborative environment is embedded in a PLC, it can produce a group that is focused on student learning and often leads to better quality teaching in the classroom (Louis & Kruse, 1995). This process further encourages staff members to dig deeper and conduct their own independent research of effective practices of both technology usage and professional development. Examining research can validate practices and perceptions. In this study participants examined research on effective elements of professional development and compared the research to their own experiences. When teachers engage in thoughtful reflective exercises that foster professional inquiry of classroom practice it has a direct impact on student learning (Mitchell & Sackney, 2000).

The summary of these findings indicates that a PLC can be used by a small group of professionals to examine existing models of professional development and make recommendations for improvement.

6.0 NEXT STEPS AND IMPLICATIONS

This study incorporated an Action Research approach designed to improve the manner in which technology related professional development activities are delivered to the faculty at the high school where I currently serve as the building principal. By using an Action Research approach, I was able to immerse myself in the study and contribute to the process while learning from the experience. In this process, participants engaged both their basic and profound knowledge of the area seeking to be improved (Langley, Moen, Nolan, Norman, & Provost, 2009). The theory of using these two forms of knowledge is that members of an organization seeking to improve a condition must have a thorough understanding of the topic being improved and the environment in which the topic functions.

In this particular study, the term basic knowledge referred to professional knowledge of pedagogy and using technology to support instruction in the classroom. In other words, the teachers selected to participate in this study required a firm understanding of teaching and learning as well as the ability to integrate technology into lesson design to support the delivery of instruction. To prepare for the study, I sought experienced teachers who acquired at least five years of teaching experience in the building where I conducted the study. I further sought members of the faculty who previously demonstrated high-level skills when integrating technology into the classroom. To identify the participants, I used my personal knowledge gained through conducting classroom observations and collaboration with the building's

Technology Integrator. This strategic sampling provided me with confidence that the members of the PLC had acquired the basic knowledge of designing and implementing effective lessons involving technology. It is important for instructional leaders to recognize the strengths of their faculty members when conducting Action Research in an educational setting.

6.1 REFLECTIONS ON THE STUDY

While designing the study, one form of basic knowledge I did not take into consideration when selecting the participants was their understanding of professional development. I learned in the process of conducting this study that members of the group also needed to have this basic knowledge in order to design a professional development activity for their colleagues. Although I did not take this attribute into consideration, once the PLC was formed we were able to acquire this knowledge by conducting research on the characteristics of effective professional development. If participants of an Action Research study are immersed in a supportive environment, they can be motivated to acquire additional knowledge, basic knowledge of the topic can be achieved, however, profound knowledge cannot necessarily be formed in a short period of time.

Profound knowledge relates to the organizational conditions that exist at the local level where the improvement initiative is designed to target. The profound knowledge valuable in this study was related to the culture of the building and the members' previous experience with professional development. The participants involved in the study had acquired at least five years of teaching experience in the building. For this reason, they had knowledge not only of their own perceptions of technology and professional development but, through their interactions with

other staff members in the building over time, they were able to gather valuable insight. Through their interactions, they were able to identify the type of professional development activities other staff members were receptive to receiving and how others in the building were using technology to support learning. By reflecting on previous professional development activities used to enhance their knowledge of technology, they were able to understand the strengths and weaknesses of these activities. Their profound knowledge contributed to forecasting strategies that would be most effective for the faculty at our high school.

Using Action Research as a framework to conduct research can be criticized for the lack of generalizations and applications outside the setting where the study was conducted to create new meaning and gain value. This point is important to highlight, as the professional development plan we designed by forming the PLC may not be meaningful or applicable for other school systems because the professional development activities were designed specifically to address the needs of our building. While designing the research questions for this study, I made a distinct effort to write questions that would produce findings that are applicable to others in the field of education, especially instructional leaders at the building level. I am hopeful the findings and related meanings from this study are valuable to others, as this study demonstrates that implementing a professional learning community to design professional development activities can be a valuable experience for both instructional leaders and teachers while improving the manner in which future professional development activities are delivered.

6.2 PROFESSIONAL LEARNING

This study demonstrated that a PLC can be used for both planning and for acquiring new knowledge. The planning and preparation phase to prepare for this type of professional development is important. This requirement was reinforced in this study as the participants provided feedback on how the preparation of learning about the attributes of a PLC and the standards for operation contributed to accomplishing our goal. In addition I learned the effectiveness of dedicating time to write a strategic goal in the form of a SMART goal. The act of preparing the group to engage in a PLC and focusing them on a common and shared goal, maintained the focus of the PLC's work. When a group collectively writes a SMART goal within the framework of a PLC the group is able to move forward by engaging in collaboration and reflection. When looking to improve a certain condition it is helpful to reflect upon previous activities to determine specifically what needs to be improved.

Another essential element I learned to be effective in this setting is to transition ownership to the stakeholders involved in the improvement efforts. The transition of ownership created an environment where members took responsibility for making decisions about the final product and the means to get there. The combination of reflection and collaboration led to a solid practice of group learning where all members had the opportunity to contribute. The small but diversified membership of the PLC helped the group develop a plan they thought would effectively address the needs of all staff members while building their capacity to effectively integrate technology into instructional lessons. In short, each of the five elements of effective PLCs shared with the group prior to forming our PLC, (shared values and vision; collective responsibility; reflective professional inquiry; collaboration; and group learning), were all attributes that contributed to the success of our PLC while we planned and learned.

As an instructional leader, I was able to acquire valuable information in regard to the effectiveness of previously designed professional development activities. Above and beyond the intended results of the research questions, I learned that teachers need a significant amount of time to process newly acquired knowledge as it relates to effectively incorporating technology into instructional lessons. In hindsight, and reflecting upon my own experiences, I actively read the feedback teachers provided after professional development activities and recognized that some teachers were asking for more time to design lessons using the technology skills that were presented during sessions. Therefore, in future activities, I intentionally included blocks of time where teachers could work independently or collaboratively with others to design classroom activities, however, the time granted was not sustained over time. Each successive professional development activity added more technology tools and applications and did not provide time to refine and revisit previous training. The approach of embedding these blocks of time was valuable to some members of the staff who were proficient with technology but created frustration and a sense of being overwhelming for other teachers.

This information was not gathered immediately in the study, but became more evident as the PLC used their profound knowledge to reflect and collaborate on their experiences with professional development. Unpacking this information contributed to the groups' feeling that our professional development was "a mile wide and an inch deep." By directly participating in the PLC, I was able to examine my own practice and synthesize data that was previously presented. I was, therefore, able to contribute using my reflective experiences as the PLC designed a professional development activity that provided sustained professional development activities over time to work with others designing lessons that will effectively incorporate technology. As a result of this study, the PLC wanted to make sure we included time across the school year to

develop the identified skills outlined in our plan. I use this point as an additional opportunity to highlight the effectiveness of implementing a PLC to design professional development activities for colleagues.

The study further reinforced the value critical listening skills have on making decisions in a group setting. In my thirteen years of building leadership experience, I have recognized the challenge to dedicate time to focus my energy on improvement initiatives. Quite often the daily operations of a building consume a significant amount of time and energy to ensure a well-run building regardless of the size of the organization. School improvement efforts require instructional leaders to invest time in planning to assemble a group of stakeholders who are committed to improving conditions while listening to their experiences, concerns, and ideas. When decisions are made in a collective manner where members of the organization have the opportunity to share their thoughts, ideas, and authentic data, it creates an environment where those individuals feel valued. The collective nature of the PLC also produces an outcome that is specific to the needs of the organization.

The participants of the PLC clearly expressed their appreciation to take part in making a decision that could potentially have an impact on how their time with professional development activities are planned in the future. Comparing the time committed to this improvement exercise with overall benefits it produced, engaging in this exercise was a worthy investment of time. As a result of the study, we designed a professional development model that we were excited to share with the rest of the staff and established a framework for how other improvements related to our field can be achieved.

By using a framework that supports reflection, collaboration, group learning, and professional inquiry, a PLC has the potential to serves as a form of professional development

while moving an organization forward to accomplish identified goals. An important element that must not be overlooked is the planning and preparation involved prior to organizing the PLC. I found value in organizing my thoughts prior to the study to determine my desired outcome while carefully leaving the process of achieving the goal to the PLC. By valuing the input of others and making decisions based on the formation of new knowledge was an effective strategy. Therefore, I found effectiveness in transitioning the ownership of the PLC to the participants. The final decision of the PLC was formed on previous experience and the willingness of the group to acquire new knowledge.

In a broader picture, PLCs have traditionally formed by assembling groups of teachers to reflect on their current practice while learning from others to improve instruction in their classrooms. This study demonstrates that PLCs can be expanded to help an educational organization reflect on current practice while forming new knowledge that can be used to enhance the capacity of a building.

6.3 OPPORTUNITIES

The study falls short of determining the impact the professional development activity designed by the PLC will have on the remainder of the staff. This shortcoming, however, creates an opportunity to extend the study to gather additional data in this area. My plan moving forward is to implement our professional development activity during the 2018/2019 school year as outlined in the study. As a group, we plan to continue to meet as a PLC and refine our activity while making adjustments to the plan. We plan to design metrics to determine if the plan improves the quality and effectiveness of professional development experiences for members of our faculty.

The next phase of this research cannot be accomplished without implementing the professional development activity and acquiring additional data from the faculty. These data will be collected throughout and at the conclusion of the 2018/2019 school year. As mentioned previously, the members of the PLC are vested in improving the quality of professional development and want to see this initiative successful because the process fostered a sense of ownership in the initiative.

Through this experience I plan to use a similar model while investigating how our facilities can be better used to support teaching and learning. I plan to assemble a PLC whose members have basic and profound knowledge to make progress toward this goal. Members of this group will have the opportunity to grow professionally by researching how facilities can have an impact on teacher effectiveness and student learning.

The implications of this study will not stop at the building level by implementing our professional development plan and using this model to improve other areas of concern in the building. As requested by members of our central office, I will share the details of my study with instructional leaders at the district level. On a regular basis, our superintendent assembles our leadership team to align our actions with our strategic plan. Each meeting has a focus on providing this core team with professional development. While sharing my experiences and professional learning with my colleagues, I will highlight the meaning of my study with the associated findings so that others in the district can consider acquiring these types of data from their buildings to enhance or strengthen professional development activities. In addition, my presentation will share the value of implementing PLCs in a traditional manner by forming small groups of teachers to examine instruction and learning practices in the classroom. I will emphasize the impact and value PLCs can have on student performance when implemented in an environment that encourages and fosters reflection, collaboration, and group learning. If

executed across the district, this exercise may improve the manner in which professional development activities are delivered to faculty members and have an impact on student achievement.

APPENDIX A

EMAIL SEEKING PARTICIPANTS

Dear Faculty Members,

I am a doctoral candidate at the University of Pittsburgh and am conducting my dissertation research. The focus of my dissertation topic is to examine the workings of a Professional Learning Community (PLC) as it designs professional development activities related to using technology to support classroom instruction.

I received permission from our superintendent to conduct the research here at North Allegheny Senior High School and am seeking high level technology users to participate in the study. You were selected based upon classroom observation and feedback received from our Technology Integrator. By volunteering for this study, you will agree to participate in a six week PLC with other members of the faculty. As a participant, you will participate in professional development activities and individual discussions while collaborating with your colleagues to design customized professional development to build the capacity of other staff members in the building.

I will use an Action Research strategy to conduct the study and therefore, I will be an active participant in the PLC. If you are interested in volunteering for this study or if you would like to acquire additional information please respond to this email.

Sincerely,

John W. Kreider

APPENDIX B

LETTER TO SUPERINTENDENT

Dear Dr. Scherrer,

I am a doctoral candidate at the University of Pittsburgh and am in the process of writing my dissertation. The focus of my dissertation topic is to examine the workings of a Professional Learning Community (PLC) as it designs professional development activities related to using technology to support classroom instruction. The purpose of this correspondence is to receive your permission to conduct this research with high level technology users at North Allegheny Senior High School.

This study will focus on how a PLC can design and implement professional development activities to increase the participants' ability to use technology to support classroom instruction. To design these activities, the PLC will reflect upon and use their initial perceptions of traditional methods of providing professional development, as well as their knowledge, and skill level regarding technology. The final aspect of the study will explore the value of implementing a PLC to design professional development activities. The results of this study will be valuable to the extended faculty at the school, the North Allegheny School District, as well as other school

districts that have an interest in forming PLCs and using technology to support classroom instruction.

Pseudonyms will be assigned to the school district and each of the teacher volunteers participating in the study in order to protect the privacy of all stakeholders. Participation in the study is completely voluntary and participants may withdraw from the study at any time. Attached is copy of the correspondence I plan to email to a selected group of teachers at the senior high school. Attached to this correspondence is the names of the teachers I have selected. Prior to conducting the study I will provide you with a list of names of those participating in the study.

The teachers selected for the study will participate in semi-structured, work sessions, and individual discussions. Semi-structured interviews will be captured using an audio recorder. Once all research has been conducted and the data have been transcribed and thoroughly analyzed, the audio recording will be destroyed. Throughout the study, the transcripts and recordings will be safely secured.

Should you approve of this study to be conducted at North Allegheny Senior High School, please provide me with written approval. In addition, should you have any questions regarding any aspect of the study, please do not hesitate to contact me.

Sincerely,

John W. Kreider

APPENDIX C

PROFESSIONAL GROUP CONVERSATION PROTOCOL

Thank you once again for agreeing to participate in this action research study. As we prepare to begin I want to remind all participants that this discussion will be recorded using an audio recorder. For security purposes, I will be the only individual with access to these recordings. I will transcribe the audio recording and maintain both the recording and the transcripts in a secure location. During our discussion, we will use our given names, however, during transcriptions a pseudonym will be assigned to each participant to provide you with anonymity. Once all research has been conducted and the data have been thoroughly analyzed, the audio recording will be destroyed. Prior to beginning are there any clarifying questions I can answer for you?

Semi-Structured Group Interview prompts:

Prior to officially forming our professional learning community, I would like to gather information related to your experiences with past professional development activities at the district and building level. Keep in mind, a major part of this research is to improve the manner in which we deliver professional development to our staff.

1) Let's first talk about the topics and content of professional development in the past, how much input have you had in the professional development topics that have been offered by the district? (Q1 & Q2)
    a. Do you feel the topics relevant to the profession?
    b. Have traditional professional development activities had a specific focus on the classroom with a direct relationship to student achievement and learning?
    c. Have you had the opportunity to provide input on the topics that are used for professional development?
    d. If you had the opportunity to provide input on the topics that were offered, do you feel that would add to the overall quality of professional development activities?
2) Let's switch to the planning phase of professional development. How have professional development activities been planned in the past? (Q2)
    a. How have you provided input on how the content was delivered to staff members? Tell me about that experience.
    b. Do you feel your input was valued or made a difference on future planning of activities? Why or why not?
    c. Has anyone planned professional development activities for themselves? How has that compared to the professional development offered by the district?
3) How much involvement have you had in the past with the delivery of professional development activities? (Q2 & Q3)
    a. Has anyone taken an active role in delivering professional development to other staff members? Tell me about that experience.
    b. How much input have you had in the past to alter the direction of the learning exercises embedded in the professional development?
4) During previous professional development activities, what was the average size of the group participating in the activities? (Q2 & Q3)
    a. Have you had the opportunity to work in smaller groups in the past?
    b. How does the size of the group impact your experience with professional development?
5) During traditional professional development how much emphasis was placed on collaboration with other staff members? (Q2 & Q3)
    a. Did the professional development foster reflection, questioning, reviewing, examining, and challenging ideas of others and yourself?
6) Has traditional professional development made direct connections with the classroom, did it require observation and collaboration with other staff members? (Q2 & Q3)

APPENDIX D

POST INTERVIEW QUESTIONS

Thank you again for continuing to participate in this research study. As we prepare for this session I want to remind you that this discussion will be recorded using an audio recorder. For security purposes, I will be the only individual with access to this recording. I will transcribe the audio recording and maintain both the recording and the transcripts in a secure location. During our discussion, feel free to use names of others in the group, however, during transcriptions the pseudonym assigned during our first discussion will be used to provide all participants with anonymity. Once all research has been conducted and the data have been thoroughly analyzed, the audio recordings will be destroyed. Prior to beginning this session are there any clarifying questions I can answer for you?

1. What was a critical component in working in a PLC to learn about your perceptions, knowledge or skill level in regard to using technology to support classroom instruction? (Q1: perceptions, knowledge, skills)
    a. Was there anything about the composition of the group that helped?
    b. How comfortable were you sharing your feelings?
2. How was this process helpful in contributing to your formation of new knowledge? (Q1: perceptions, knowledge, skills)
    a. What aspect of the PLC helped the most?
    b. Any part of the process that was most appealing to you?
    c. Share some detail on the collaborative experience, did you feel safe to challenge your ideas or the ideas of others?
3. What areas related to using technology to support classroom instruction do you feel you grew the most? (Q3)
    a. Were you surprised with anything you learned?
4. What specific skills related to using technology to support classroom instruction did you learn? (Q3)
    a. How will you apply what you learned?
    b. How much focus was placed on student achievement and learning?
5. What was the most powerful experience of working in PLC to design the professional development? (Q1: perception, knowledge, skills, Q2)
    a. What part of the PLC allowed the group to be successful?
    b. Were there any elements missing that hindered the group's success?
    c. What was the benefit of working in a PLC?
    d. Did you have the opportunity to reflect upon your own practice? Did that have an impact on your own personal growth?
    e. How much control did you have over the direction of the PLC and how did that impact your learning?
6. How did this experience compare to other professional development activities for which you were involved? (Q3)
    a. Did you learn more or less from this experience in comparison?
    b. Would you like to see the district use this form of professional development more often in the future?
7. How do you feel our staff will respond to the professional development activities we designed? (Q2)

APPENDIX E

PROFESSIONAL LEARNING COMMUNITY STANDARDS

1. We will start and end all meetings on time.
2. We will press each other to think critically.
3. We will value the input of others.
4. We will treat all members of the group with respect.
5. We will remain focused on our SMART goal.
6. We will take responsibility for our decisions as a group.
7. We will consider all forms of data.
8. We will ask questions when we do not understand.
9. We will measure our progress regularly.
10. We will remain focused on representing the needs of our colleagues.

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