1-1-2018

Intellectual and physical shared workspace: Professional learning communities and the collaborative culture

Daniel Carpenter
Texas Tech University, dacarpenter@cu-portland.edu

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Authors: Dr. Daniel Carpenter

Abstract: Professional learning communities are one of the leading school reform movements. Schools have shifted to a collaborative culture where administrators and teachers physically and intellectually interact using a collaborative inquiry process for professional learning. The workspace interactions include shared leadership, decision-making, teaching and learning practice, and accountability measures. Attributes and characteristics of effective collaboration and professional learning communities greatly affect the outcomes of professional learning communities. An emergent framework is provided that includes attributes of effective collaboration and the characteristics of effective professional learning communities that merge into intellectual and physical shared workspace. Recommendations are provided on the role administrators and teacher leaders play in using the frameworks to ensure greater emergence of activities and products from the collaborative inquiry process.

Introduction

General Introduction - Educational reform efforts have called for a change in how teachers interact and exchange information both in and out of the classroom. Reform efforts have focused on increasing teacher interaction in formal settings (Hofman & Dijkstra, 2009). Much of the reform movement has focused on creating a collaborative culture (Brendefur, Whitney, Stewart, Pfiester & Zarbinisky, 2014; Deal & Peterson, 2010; DuFour & Eaker,1998; Louis, Marks & Kruse, 1996). School culture are traditions and rituals that have built up over time based on educators working together to maintain a collaborative focus on student achievement (Schein, 1985; Deal & Peterson, 1990; Deal & Peterson, 2010; Talbert,1991). In particular, teachers share values, beliefs, and behaviors that reflect the school's social norms (Groseschl & Doherty, 2000). Social norms include how, when, where, and to what extent collaboration takes place, but also what teachers take from collaborative opportunities (Giles & Hargreaves, 2006; Kohm & Nance, 2009).

Professional learning communities (PLCs) are formal networks that have taken the forefront of reform efforts to increase teacher collaboration and impact school improvement (DuFour, DuFour, & Eaker, 2008). Professional learning communities occur when educators work together in a collaborative culture to analyze student achievement, share pedagogy, and find areas for improvement in teaching, learning, and student achievement (DuFour, DuFour, Eaker, & Karhanek, 2004). The professional learning community is structured to create opportunities for teachers and administrators to share a common workspace, and a commonality in a collaborative setting that create a shared workspace (DuFour & Eaker, 1998; Martin, 2014; Stoll, Bolam, McMayon, Wallace & Thomas, 2006).

The paradigms of school culture and collaboration synergistically intermingle into a collaborative culture of practice in schools (Deal & Peterson, 2010; Talbert, 1991). Collaboration may be the physical action of communicating and working with others to produce or create something (Vangrrieken, Dochy, Raes & Kyndt, 2015). Collaboration may also be the intellectual social norming to ensure effectiveness of collaboration where teachers and administrators work together to common purpose and goals (DuFour et al., 2008; DuFour et al. 2004; Feger & Arruda, 2008).

In the reform movement to establish a collaborative culture, schools have adopted common planning time for teachers and administrators to share vision and leadership through directional discourse (Tam, 2015). Professional learning Communities have taken the directional forefront in the reform movement to provide opportunities for educators to share workspace in a collaborative culture (Achinstein, 2002; Hofman & Dijkstra, 2009; Little, 2002; Schechter, 2008). Shared workspace is the physical and intellectual interactions required for mutual planning, decision-making and problem solving in the collaborative culture (Leonard & Leonard, 2001; Shank, 2005; Smith, 2014). In a shared workspace, educators share intellectual contributions in a PLC from mutual planning, decision-making and problem solving based on student achievement. Teachers share physical contributions in the form of lesson plans, assessments, pedagogical applications and student outcomes. The shared workspace for teachers is the overlap between their intellectual and physical contributions where teachers effectively collaborate and problem solve on potential pedagogical and assessment innovations. The shared

workspace is attained when teachers mutually share values, vision goals and leadership of shared intellectual and physical contributions to their work.

This manuscript focuses on the shared space teacher occupy in a collaborative culture, often times as part of a professional learning community. A decade-long investigation of five schools and communities that participate in a professional learning community as part of the school culture are captured in bits and pieces. Teachers as leaders interact together in the collaborative culture, struggle to find ways to fit the PLC model and share both physically and intellectually to satisfy the criteria for what it means to be a professional learning community. The literature on professional learning community characteristics are described, but what has been deficient in that literature is a mechanistic description of the interactions (physical and intellectual) and what happens when one or both break down. It is argued here that the shared workspace model provides a more holistic framework for schools to identify functionality of the collaborative culture and what happens when teacher share space for professional learning as a community of professionals.

Research question - The research question guiding this study was how did professional learning communities provide a collaborative shared intellectual and physical shared workspace for teachers to reach mutual values, vision, goals and leadership of teaching and learning?

Research purpose - The purpose of this investigation was to explore shared workspace and professional learning community interactions in schools. Furthermore, the purpose was to investigate the collaborative culture and the intellectual and physical interactions that took place as a result of collaboration. The collaborative culture and professional learning communities were parts of the school culture. The collaborative culture of each school was designed to ensure teachers share intellectual and physical contributions in learning to investigate the impact of teaching and learning on their students. The workspace overlap for teachers was part of the culture of each school and a function of the professional learning community interactions. Professional learning communities provided opportunities for collaboration and therefore opportunities for teachers to share intellectual and physical workspace.

Conceptual Framework - Professional learning communities operate under the assumption that the key to improve teaching and learning is continuous, job-embedded learning and professional development for educators (DuFour et al., 2008). Feger and Arruda (2008) and Bolam et al. (2005) state the characteristics of effective PLCs includes a supportive and shared leadership, shared purpose and values, a collaborative culture, problem solving and collective inquiry on teaching and learning, and continuous improvement of the school. The concepts of shared and collective improvement based on intellectual and physical interactions are well documented in schools (Stoll, Bolam, McMahon, Wallace & Thomas, 2006; Hargreaves, Lieberman, Fullan & Hopkins, 2010; McNamara, Murray & Jones, 2014). The sharing of purpose and values, the collective improvement is acquired in the collaborative culture of the workplace.

A collaborative culture is the way teachers and administrators physically and intellectually interact when sharing information about their practice (Nelson, Deuel, Slavit & Kennedy, 2010; Riveros, 2012). The collaborative culture involves a systematic process of working together, interdependently, to analyze and impact professional practice in order to improve student

achievement (Nelson et al, 2010). The collaborative culture is interactive, where teachers and administrators utilize their expertise to share what they do in hopes of helping to improve their practice (Sinnema, Sewell & Milligan, 2011). For collaboration to be effective teachers and administrators must interact in this shared workspace, physically and intellectually, to critically evaluate ideas and issues associated with their teaching and learning skills, knowledge, and experiences.

Problems in schools today largely center on student achievement. Teachers solve problems to increase student achievement in the physical setting that is the professional learning community (Cormier & Oliver, 2009; DuFour, Eaker & DuFour, 2005; Reichstetter, 2006). Teachers and administrators focus on collective collaborative inquiry regarding teaching and learning, based on implications from student achievement (Bolam et al., 2005; Vescio, Ross, & Adams, 2008). Collective collaborative inquiry of teaching and learning must ensure an increase in student achievement (Nelson et al., 2010; Riveros, 2012). Teachers intellectually challenge how teaching and learning has taken place based from student achievement and use that information to intellectually and physically interact with peer teachers to shape teaching methods and innovations (Bolam et al., 2005; DuFour et al., 2005).

A school's collective collaborative inquiry process serves as a catalyst for the intellectual interactions needed for teaching and learning innovations developed in the professional learning community (Nelson et al., 2010; Sinnema et al., 2011; Riveros, 2012). This intellectual process ensures that teachers build shared knowledge by looking at achievement data, reflecting on past teaching and learning practices, and finding physical pedagogical avenues for teaching and learning innovations to increase student achievement.

The improvement of teaching and learning requires teachers and administrators to systematically engage in an ongoing cycle of gathering data of current student performance, reflecting on past teaching and learning, developing strategies and innovative practices to ensure all students achieve, implementing the innovations, analyzing the impact of the innovations, and applying the new knowledge gained from the cycle to the next cycle of continuous improvement (Bolam et al., 2005; Carpenter, 2012; DuFour et al., 2008; Vescio et al., 2008). The goal of a culture of continuous improvement is to create an environment for perpetual learning for students, teachers and administrators.

A collaborative culture is established when educators intellectually and physically share vision of quality teaching and learning in face to face meetings where ideas are merged through discussion and record keeping (Leonard & Leonard, 2001; McLaughlin & Talbert, 1991). Together, teachers and administrators set goals that lead them to the vision for teaching and learning. Teachers and administrators establish social norms of discourse when teaching and learning are discussed openly and honestly. Each member of the collaborative group must have equal value and voice in the outcomes of group interactions (Carpenter, 2015).

The purpose of the collaborative group in the schools are to establish the intellectual rights of each educator, to have ones thoughts be part of the group. The collaborative group also establish the physical rights of each participant to be heard while at the same time, provide a platform for diverse views to be shared. The intellectual and physical rights are called voice. Voice refers to a

series of key attributes of effective collaboration participants must meet in order for the shared workspace to ensure effectiveness. Participants in the shared workspace must meet the key intellectual and physical attributes for the professional learning community to be an effective component of the shared workspace (Friend and Cook, 1997; Gosselin & Bonstetter, 2003; Martin, 2014; Muijs, Ainscow, Chapman & West, 2011; Tam, 2015). In order for a collaborative culture to function as a part of the learning community, intellectual and physical participation in the workspace must be voluntary, based on parity, requires shared goals and responsibilities for key decisions, shared accountability for outcomes, shared resources and is emergent.

The physical workspace blends a collaborative culture in with the professional learning community and the culture of a school as a workplace to ensure educators work together in the intellectual workspace. The physical and intellectual workspace must meet several key characteristics to ensure a functional professional learning community (Carpenter 2012; Carpenter, 2015; DuFour et al., 2005; Leonard and Leonard, 2001; Martin, 2014; Nelson et al, 2010; Stoll et al., 2006; Smith, 2014; Tam, 2015; Talbert, 1991). The five characteristics of PLCs proposed by the summative literature are as follows:

1. Shared-leadership and decision-making - Shared leadership and decision-making are critical to the shared workspace dynamics, where teachers and administrators are empowered to be co-leaders in setting the direction for teaching and learning.
2. Collaborative inquiry – The shared workspace includes collaborative inquiry and problem solving by educators to determine effectiveness of teaching and learning given assessment systems and achievement data. The shared workspace is the collaborative space educators leverage to look at data, plan, share ideas and set direction for teaching and learning experiences. The emergence of teaching and learning experiences new and unique to students is known as an innovation.
3. Shared practice – Shared workspace provides opportunities for teachers and administrators to share teaching and learning practice based on student achievement, goals, and direction of the collaborative inquiry process.
4. Accountability for outcomes – Participants in the shared workspace must have an acceptance and accountability for the outcomes of the collaborative inquiry process, student achievement and the direction for teaching and learning.
5. Evolving relationships - Evolving personal and professional relationships between group members impacts practice in the shared workspace. Trust, shared beliefs of practice and shared values for outcomes evolve as the depth of relationships increase over time. Moreover, the shared workspace must provide opportunities for rich, deep professional relationships where teachers and administrators can approach conflicting values and beliefs in a respectful, mutually caring way.

Although the five are presented sequentially, they can be allocated into two categories: physical and intellectual. For example, shared-leadership requires educators to work together to emerge with curriculum and assessment innovations that are physical manifestations of intellectual discourse. In the same regard, decision-making for the holistic implementation of those physical manifestations requires overlap in participants' intellectual capacities to ensure implementation fidelity. The same can be said about shared practice. If an educator is to emerge from a physical interaction in a professional learning community setting with an innovation, intellectual discourse must challenge current practice in order for emergent innovations from PLC

interactions to be implemented with fidelity in the classroom with students. Shared-practice is both physical (the exchange of lessons) and intellectual (the capacity to consider ones own practice while at the time extrapolate how to incorporate something different as an innovation in ones on current practice). Collaborative inquiry, accountability for outcomes and evolving relationships all require a physical and intellectual overlap in the shared workspace.

The overlaps between the physical and intellectual interactions are finely engrained in a school's culture, professional learning community, and the collaborative culture. How physical sharing takes place in a school is part of the social, physical and intellectual norms of the workplace. Moreover, the sharing of ideas, considering the position, expertise and contribution of a each educator is part of the school social norms of a school's culture. Levels of acceptability of physical and intellectual contribution and interaction vary greatly because of differing school culture. Thus, the concept of the shared workspace is defined by the overlap between the physical and intellectual workspace. The emergent framework of the shared workspace, inclusive of the school culture, professional learning and the collaborative culture provides opportunity for the investigation of exactly what educators collaborate on, what is constructed, and therefore what is taken from the PLC and leveraged in the teaching and learning given these interactions physically and intellectually (Carpenter, 2015; Leonard & Leonard, 2001; Shank, 2005; Smith, 2014).

Relevance of the Study - This study is important to the ongoing investigation of PLC interactions and their impact on schools, teachers, teaching and learning, and student achievement. Much of the literature from 2003-2015 on PLCs, professional development, and school improvement has been focused on three primary areas: (a) What is the connection between PLC outcomes and student achievement?; (b) What are teachers' perceptions of the impact of PLCs on their practice?; and (c) What is the impact of teacher collaboration in PLCs on student achievement? (Carpenter, 2015; Cormier & Oliver, 2009; Feger & Arruda, 2008; Lomos, Hofman, & Bosker, 2011; Reichstetter, 2006; Supovitz & Christman, 2003; Vescio, Ross, & Adams, 2008).

Specific case-study investigation of the collaborative culture, shared workspace, and the impact of PLCs on teacher pedagogical adaptation have yet to reveal what teachers collaborate on and how the collaborative interactions impact teacher practice. The overall importance of this investigation is in the establishment of the merit of shared workspace, specifically the physical and intellectual interactions as part of PLC function. This research study was developed to investigate the collaborative culture and detail what practices educators develop and further implement as pedagogical innovations and adaptations to their current practice from the shared workspace. Moreover, this investigation attempted to determine what characteristics of shared workspace and effective collaboration existed that may had promoted and/or hindered effective culture and professional learning communities.

There are gaps in the literature on the school as a workplace, educator professional learning and whole school organizational learning applications. Educators interact in schools thereby defining the school as a workplace. Physical and intellectual contributions in the school as a workplace provide opportunity for organizational improvement within a culture of collaboration. Intellectual and physical interactions in the workspace where educators collaborate provide

opportunity for improvement of the organization through shared practice in the workplace. This study served two main purposes: 1. Contribute to the case study literature on professional learning and teacher interaction. 2. A derived theoretical model that combines professional learning community characteristics needed for effective collaboration and the intellectual and physical interactions that lead to effective improvement through educator problem solving.

Methods

Participants – A grounded theory research approach was taken to this investigation, primarily because of the common experiences of educators in schools (Creswell, 2013). Collaborative process between educators in schools was qualitatively investigated as a function of professional learning community interactions. Three communities, five schools, and seventy educators were purposefully selected to participate. Data were collected, including semi-structured interviews, observations, artifacts and researcher field notes.

Sampling and Data Collection – Semi-structured interviews and observations were collected and supplemented by document analysis of PLC meeting minutes and teacher-based instructional materials. The researcher assumed an interviewer and observer role by conducting all interviews and attending meetings, discussions and activities.

Semi-structured interview protocols were designed based on the literature about PLCs, effective collaboration, school culture and the school as a workplace. Two semi-structured interviews were conducted for teachers and administrators. Administrators and teachers at each school were initially interviewed to obtain information about PLC interactions and practice, school culture and the key characteristics and attributes of the collaborative culture. Observations and the subsequent interviews were designed to collect information about the concepts of shared intellectual and physical contributions in PLCs and the contributions of those ideas to teacher pedagogical innovations; documents, archival records and physical artifacts were collected from PLCs and teacher practice both before and after PLC interactions over an entire academic year for several years at each school. Teacher classrooms were observed, field notes were taken, documents and artifacts were collected.

Data Analysis – Data analysis and data collection were simultaneous activities in this study (Merriam, 1998). Interviews were audio recorded and transcribed verbatim using qualitative techniques (Creswell, 2013; Creswell & Miller, 2000; McMillan & Schumacher, 2009; Stake, 2010).

Interviews were transcribed, coded, and then developed into themes (axial coding that lead to theme development). Interview transcripts, codes and themes were checked for validity through member checks (Creswell & Miller, 2000; Miles & Huberman, 1994). Initially, the themes were found based on the literature and reading: shared activities, collaboration, collective inquiry, school culture, professional learning communities, and shared workspace. Follow up reading from member checks provided sub-themes within themes. Themes and sub-themes were then provided in follow up member checks based on transcripts, codes and themes. The intersections of codes and themes were then investigated to determine convergences for potential theory development on the PLC characteristics as part of the shared workspace.

Observations and field notes from PLCs provided documents and physical artifacts for data, categories within each theme using elements of shared activities, collaboration, collective inquiry, school culture, professional learning communities, and shared workspace to ensure trustworthiness of the data.

Follow up interviews went through the same set of verbatim transcription, coding, theme, member checking, and sub-theme development. Transcripts, codes, themes, and sub-themes were provided to participants for follow up member checking to ensure authenticity and to ensure trustworthiness of the data.

To ensure qualitative data trustworthiness, several methods were used. The credibility of the data was established through a prolonged engagement with participants in the field and by the use of data triangulation by collecting multiple methods of data collection, such as observations and interviews (Merriam, 2009). Peer debriefing was applied. Peer debriefing was performed in the interview process as the researcher paraphrased the interviewees' idea to refine and interpret meaning. This process was used to confirm interpretations and coding decisions including the development of themes, sub-themes and codes.

To ensure transferability the researcher employed thick rich descriptions of the context of the study as well as the activities of the participants seen through direct observation (Lincoln & Guba, 1985). Dependability was established through triangulation of data from multiple sources as well as the use of an audit trail (Erlandson, Harris, Skipper & Allen, 1993). Conformability was established through two measures: an audit trail and the researcher reflexive journal (Lincoln & Guba, 1985).

Findings

The key characteristics and attributes detail a functional professional learning community. Observations and interviews at schools provided the general frameworks for the physical and intellectual interactions of the shared workspace.

Shared-leadership and decision-making – The shared workspace includes shared decision-making and shared leadership. Shared decision- making is when teachers and administrators are equally empowered to be co-leaders in setting the direction for teaching and learning (Carpenter, 2015; DuFour et al., 2008). Shared leadership tasks are distributed to team members so that the team members lead each other (Carpenter, 2015; Vangrieken et al., 2015).

Two of the five schools had systems in place that elevated teachers into shared leadership positions. Teachers and administrators made decisions to co-lead the direction for teaching and learning in classrooms. Committees were also formed to determine, write and diagram school improvement goals. Committees met specifically to determine how well PLCs were functioning and determine methods to ensure teacher functional work in PLCs. The goals were aligned to PLC practice. Teachers and administrators discussed PLC function and outcomes freely. Every group member was expected to speak, but there was no facilitator that ensured input from each

participant. Teachers were first selected to serve on the committee, but readily volunteered stating the potential for impact leadership of PLCs.

> *Even though I was asked specifically to serve on the PLC committee, I would had volunteered. Serving my peers, knowing I was going to be able to impact what went on in PLCs was more than worth my time.*

Group members determined the outcomes for the committee. Some group members seemed to accept responsibility for accountability more so than others in the division of work, but all group members agreed on what the accountability measures should be.

> *We talked about what we should measure as a school based on what PLCs were doing. It was nice knowing that our work was going to the school improvement efforts. We set the goals together but not everyone does the same amount of work.*

Schools that did not have leadership structures in place that elevated teachers to key decision making authority with administrators experienced no common goal setting. Moreover, schools that had no shared leadership structure experienced greater teacher frustration.

> *We are told what to do by the administrators. I don't know why or how they make decisions. They tell us to fill out this paperwork on our test scores and so that's what we do. I don't know what they use it for.*

> *I don't really get to work with my peers in PLC. We spend too much time filling out paperwork that has no impact on my teaching at all.*

> *I can tell my peers are frustrated with PLCs because we come in here for 45 minutes, some come in late and some leave early. But for some reason I am the only one filling out this test score information and submitting it.*

> *Teachers have to be held accountable for their PLC process. If they served in leadership of PLCs, who would watch over them and make sure things get done?*

Observations of schools with shared leadership structures revealed more teachers working collaboratively to complete PLC goals. Time on task in committee and PLCs were high compared to schools that did not have shared leadership structure. Teachers that did not share leadership and decision making had little buy in and therefore the quality of the products were superficial, serving only teacher accountability to a predesigned set of goals that were either not shared or poorly communicated by administrators in top down established goals from administrators for teachers to adhere to. Teachers and administrators worked together as a team to ensure goal setting and accomplishment by the team of teacher and administrators for the school.

PLC intellectual and physical interactions were very rich in schools that had shared leadership and decision making structures. Teachers engaged in intellectual discourse with parity on key decisions and accountability. Activities and outcomes from the PLCs were emergent of project

activities for teaching and learning. Schools that did not share leadership and decision making structures had goals established for them by administrators or teacher leaders and dictated using a top down management structure. Predesigned forms, diagrams and interactions were stipulated and the richness of the intellectual and physical discourse decreased significantly almost to extinction with several teachers in each of the PLCs in these schools.

Collaborative inquiry – The shared workspace includes collaborative inquiry and problem solving by teachers and administrators to determine effectiveness of teaching and learning given assessment systems (DuFour et al., 2004; Nelson et al., 2010; Riveros, 2012; Sinnema et al., 2011). Intellectual and physical interactions in the shared workspace includes the collaborative space teachers and administrators use to look at data, plan, share ideas and set direction for teaching and learning experiences.

All schools participating in the study provided a physical space and time for teachers and administrators to meet. Each school required teachers to meet in content specific groups (eg. science, social studies, etc.) to accomplish a set of tasks. Schools required teachers to "look at data" and determine "next steps".

> *We look at student achievement data on assessments and report our findings to administrators. I'm not sure what they do with it from there.*

> *I bring my data from tests or quizzes and others in the PLC do the same thing, we report where our students are at the time of the test then try to decide what to do next.*

All schools had systems in place to helps teachers problem solve assessment scores to determine "next steps". Systems included action research oriented materials (Mills, 2010; Wilson, 2013) to assist PLC teams in considering where students were, why and how to proceed with potential teaching and learning remediation. Two of the three schools measured successful student assessment outcomes as a function of teaching, while one of the three reported scores, considered remediation, but regarded student outcomes as a product of poor student learning with little reflection on teaching.

> *We try pretty hard to look at student scores and figure out what to teach next.*

> *Our students hit achievement goals with their test scores, but their performance is due to their time on task, completion of homework and stuff like that. We can teach, but it's the student's responsibility to learn.*

It was interesting to observe these PLCs because teachers spoke freely and with parity of contribution. The PLC groups established teaching and learning goals and projected outcomes for achievement, teaching and learning. They spent more time communicating than groups that did not share parity of contribution to the PLC. Groups with parity were also outcome oriented (establish assessment type, measure student success, discuss outcomes, determine next teaching and learning steps, etc.). The group discussed how to take responsibility for accomplishing each step in the process, thus making the PLC group emergent in outcomes.

The schools that had no systems in place for action research reported student scores as a mapping of student achievement with no connection to teaching, learning and/or remediation cycles for student outcomes. There was little work on problem solving and collaborative inquiry. There was goal setting, but from school leadership. The responsibility for decision-making was disconnected from some PLC members in that one or two members would do the work, while two or more would sit quietly and work on their classwork. There was little collaborative accountability, the group was not emergent in teaching and learning activities. Little time was spent on effective teaching and learning intellectual or physical discourse or communication.

Shared practice – Shared workspace provides opportunities for teachers and administrators to share teaching and learning practice based on student achievement, goals, and direction of the collaborative inquiry process (Vescio, Ross & Adams, 2008). Intellectual and physical interactions provide opportunity in the shared workspace to emerge with teaching and learning activities reflective of each teacher's practice.

All schools participated in a physical shared workspace where teachers met for at least 45-90 minutes and discussed teaching and learning practices. As stated previously, schools had teachers chart student achievement outcomes, but often-intellectual discourse, conversations and communication in the PLC resulted in teacher discussions of their teaching and student learning challenges. Little if any charting or diagraming of these conversations took place in any of the schools. The intellectual exchange during meetings was unequal between participants. Some group members contributed more in the discourse and discussion than did others.

> *Just because everyone doesn't speak up during the PLC doesn't mean we aren't thinking about ways to do the work. I listen to what everyone is saying and try to incorporate the activity, test, quiz, whatever into my teaching.*

> *My objective is to help my students to master this stuff, to get things figured out. My colleagues are smart, I need to be able to draw ideas, activities, teaching from them.*

Schools with greater emergence of activities from shared leadership structures had more teaching and learning activities emerge from the shared workspace. Teachers worked to develop common assessments, rubrics, teaching, and learning activities collaboratively. Teachers that had been teaching longer seemed to volunteer resources and activities with greater frequency, but each group member of the collaborative PLC team contributed and was valued equally.

> *I've been teaching for about 7 years and there are some in the PLC that have been teaching for 15 or 20, but we really respect each other and so I can share freely what I do, why and how and people listen.*

Schools that did not have shared leadership structures or have expectations for action research outcomes did not have teachers share practice at a deep intellectual level (Nelson et al., 2010). Teachers in these PLC groups met in the physical workspace but did not share practice and/or take ideas of their colleagues back to the classroom to improve their practice. Teachers in these groups did not view PLC as voluntary and therefore did not express the need to adopt and/or adapt their practice from the PLC experience.

I have been teaching for 30 years and I don't want to say that I can't learn something new, but I know what works with my students.

Look, PLCs are a great and I am sure there is research that says it's a good thing to do, but I am here to teach kids and my students get from me what I know to be the best practice. I don't need time to share what I do because I really need the time to teach, that's what I get paid to do.

All teachers had respect and appreciation for their colleagues in participating schools. The lack of shared intellectual interaction between teachers in schools that did not have shared leadership structures or action research expectations created a toxic culture that resulted in little professional learning. Though teachers shared practice at all schools, the lack of professional collaborative inquiry between teachers resulted in little intellectual shared workspace.

Accountability for outcomes – Participants in the shared workspace must have an acceptance and accountability for the outcomes of the collaborative inquiry process, student achievement, and the direction for teaching and learning (Talbert, 2010). The shared workspace at schools had intellectual and physical interactions to share accountability of the PLC outcomes as well as classroom and or student outcomes. Teachers at each school had to physically emerge with student outcomes, but not all teachers at schools interacted in the intellectual discourse required for reflective practitionership with the PLC group.

As shared previously, there was great diversity of accountability for the outcomes of teaching, learning, professional learning and the PLC. All schools had expectations for teacher monitoring of student outcomes from assessment measures. All schools required teachers to have some form of common formative or common summative assessment (i.e. quiz, test, rubric).

Three of the five schools had systems in place for teacher action research and therefore actions required of teachers for accountability measures of the PLC. Teachers at these schools had a collective collaborative inquiry process established for shared goals, parity of contribution, and decision-making on what to do next in the teaching and learning process from student scores. PLC participants shared in the decision-making process. The intellectual exchange between teachers at schools grew effective collaborations from accountability measures and therefore a sharing of practice as a function of those intellectual and physical discourse exchanges.

The problem-solving piece of our PLC is the best part of the process. We talk about the data, but when we get to share how to teach, that's where I find the fun.

I love our conversations because it makes me think about what we are doing and how I can try things with my kids. My data is intriguing, but listening to my colleagues and how THEIR kids are doing is way more interesting to me.

My colleagues really make me think about what I do and what I can do.

> *Meeting for PLC is OK, but I get a real charge out of the time to reflect on my practice. Funny they actually pay me to meet with other brilliant educators and think about what I do, steal ideas from them and enrich my practice.*

The schools that did not have a system in place for teacher action research were not emergent of teaching and learning activities from student accountability outcomes. Intellectual discourse, communication and exchanges between teachers at schools that did not have action research based PLC practice did not have rich intellectual discussions about teaching and learning outcomes. Observations of PLCs revealed superficial discussions between two or three PLC participants about their practice, what they had done with students, what worked for them, but little of that exchange was recorded and/or connected to student data, accountability measures and physical PLC interactions in meetings.

> *We meet, write out our data, report it on the form, turn that in each week and that's pretty much it. Sometimes we will talk about what we are doing in the classroom, but only if we have time after the reporting and filling out of the form.*

> *Accountability is scary, really. People get paid extra if their students perform better. There are some people that missed getting paid that little extra because of their accountability measures. But as far as sharing practice, we don't really have time because we have so much to cover and only so much time to do it.*

Richness of intellectual and physical discourse, communication and exchanges associated with accountability for student outcomes or teacher PLC interactions were greater in schools that had shared leadership structures and more defined expectations for teacher and administrator interactions based on the action research plan implementation in these schools. Observations of PLC meetings at all schools revealed more personal collective collaborative accountability in groups that valued contribution made by each member of the PLC. Contribution for PLC products, teaching and learning activities, and forms for student accountability on assessments were distributed equally between group members and therefore each group member seemed to take full responsibility for accomplishing the needed tasks.

Evolving relationships - Evolving personal and professional relationships between group members impacts practice in the shared workspace. Trust, shared values and beliefs of practice evolve as the depth of relationships increase over time (Carpenter, 2012; DuFour et al., 2004; DuFour et al., 2008; Nelson, et al., 2010; Riveros, 2012). The shared workspace provides opportunity for rich, deep intellectual interactions that form relationships where teachers and administrators approach conflicting values and beliefs in a respectful, mutually caring way.

Teachers in a well-functioning PLC collaborated freely, voluntarily and with parity of contribution. Three of the five schools had norms for collaboration, expectations for physical and intellectual participation and therefore had systems in place to ensure shared goal setting, shared responsibility for accountability, and shared decisions for emergent teaching and learning innovations.

The depth of intellectual interaction in the physical workspace varied greatly depending on the teacher expressed need for autonomy. Almost all teachers expressed concern with sharing their student test scores for fear of being judged by their peers in a negative way. The issue of trust between colleagues to share practice and student outcomes was the most discussed topic in interviews.

> *I don't mind sharing my data, but when my students don't perform well, I don't know if it's me or the kids and I really don't want to be judged because people aren't in my classroom on a daily basis.*

> *I know I am going to have issues trusting anyone with my data because my salary is dependent on student performance. I can't be judged on just my students' performance alone.*

> *We all value student success, but judging a teacher on just test scores is like judging the quality of an attorney by how much money they win their client…. It's just not fair to be judged about quality teaching when you aren't there every day.*

The length of time teachers and administrators spent working together was also a factor in the evolving relationship. The more time they spent together working on something, the more they expressed trust in one another. The more they worked together, the more they expressed joy in working together both on and off campus. Participants expressed that time working together allowed them to "get to know one another". Participants expressed that the time they spent together resulted in greater, more-rich intellectual interactions in the physical workspace resulting in a sense of deeper appreciation and respect for one another.

> *We work together a lot. It seems to me that the more I work with these people the more I can trust that they understand what I am doing and why.*

> *I have complete trust in my colleagues. I have worked with them for the last six years and we really do see things the same, we all care about our students and respect one another and what we do.*

> *The more I work my colleagues the more I trust them. I really think that if I work hard for my students, my colleagues will see that and appreciate how I teach.*

> *I think the hardest thing I have to do in my planning is to trust my colleagues, but the more we work together and communicate our teaching, the more I trust them and borrow ideas from them.*

Teachers and administrators that had more top down management experiences toward reporting and problem solving had less expressed quality intellectual interactions in the physical workspace. Participants expressed less richness to the relationships formed between them and their colleagues in PLCs group, less expressed trust and less desire to spend time together.

I don't want to say that I can't learn something new, but telling me what to do, how to do it? I can't trust someone that isn't on the ground floor with me, doing the work and trying to figure out how to help students.

It is a difficult thing to trust people when I am trying to figure out how to help my students, but then administration comes in here at tries to tell me how to solve my problems without actually being in my classroom with me.

I like my colleagues, but if we aren't going to work together to help students, why would I trust that they are going to help me get better. I would rather just not meet.

The nature of the collaboration between teachers and administrators greatly affected the quality of the relationship and the level of trust established in the group. Teachers in particular described being more motivated to collaborate within the PLC team when members valued their opinions and ideas. When teachers shared information through intellectual exchanges in the physical workspace, they expressed that they felt valued as a professional and as a person. When teachers did not have an opportunity to share information, they expressed that they did not feel valued as a professional and as a person. Teachers further expressed the need to be able to make decisions about their PLC, their classroom teaching and learning, and the school improvement process (impact on other teacher's practice). When these opportunities were provided, teachers expressed a greater degree of appreciation from their peers. Finally, teachers that expressed greater degrees of appreciation and greater feelings of being valued, the more close they felt they were to their colleagues.

You know, I don't think I have all the best ideas, but I do think I can trust people more when we can problem solve together, as a team to help the team and obviously our students as a result of that.

Having the opportunity to impact my school, at the school level is so important to me. Working with my peers to find ways to increase student achievement scores together, problem solve together how to go about this at the school level? THAT is cool.

I have ideas. I try to express those ideas as we are working together in PLC to problem solve why students failed. How we go about working together, sharing our ideas because of how we teach, that is the nature of school improvement isn't it?

The cohesion of the PLC team was greatly dictated by the amount of parity, collective collaborative inquiry, and shared decision-making that occurred. The more administrators worked side by side with teachers, the more they accepted one another as equals. The greater parity expressed by teachers and administrators in the PLC process, shared values and beliefs, the greater richness they expressed in the evolving personal and professional relationship they felt with their colleagues.

I started out being very suspicious of PLCs, but I have developed wonderful relationships with people here because of our conversions.

The collegial interactions I have had with people have really created a lasting friendship.

Our PLC group started hanging out after school, doing holiday celebrations together and stuff like that; now we are friends both in and out of school.

The more we work together the tighter I feel with these people, personally and professionally.

On the other hand, relationships did not appear to evolve beyond collegial and professional interactions when teachers did not express parity, collective collaborative inquiry, and/or shared decision-making processes. The less administrators worked side by side with teachers, the less relationships formed between teachers and the more segregated teacher groups became in PLC groups. Groups of one, two or three teachers had a tendency to form a professional and collegial relationship but did not form personal friendships that extended outside of school. The more pressure placed on PLC groups to report rather than share resulted in less interaction and less rich conversations for relationship formation.

Discussion

Professional learning communities have characteristics and attributes that promote a collaborative culture in schools (Brendefur et al., 2014; Carpenter, 2015; Deal & Peterson, 2010; DuFour et al., 2008; Gosselin & Bonstetter, 2003). The characteristics of PLCs are well documented throughout the literature (Bolam et al., 2005; DuFour et al., 2008; Hord, 1997; Kruse, Louis & Byrk, 1995; Louis & Marks, 1998; Vescio et al., 2008). Much of the literature from 2003-1015 on PLCs focus on connections between teacher perceptions, PLC structure and student achievement (Carpenter, 2015).

Schools and school districts have invested in PLCs as a model for school improvement, teacher learning and a cultural foundation to how teachers collaborate in the school as a workplace (Carpenter, 2012; Tam, 2015). Schools with a collaborative culture and professional learning communities provide physical and intellectual opportunities for teachers to work together, collaborate on instructional practice and innovate instructional practices. Collaborative practices in the workplace promote teacher sharing of information. Teachers share information intellectually and physically. The sharing of information provides teachers with an organic problem solving process where one or more teachers work to improve their instructional practice by gaining knowledge from one another in a professional learning community. Sharing information intellectually and physically information is called the shared workspace.

The five schools investigated in this study had implemented PLCs for at least four years. Administrators and teachers had all been trained on PLC structure and function. All participants described the purpose of a PLC as a collective collaborative inquiry process. Participants stated the purpose of the collaborative inquiry process was to investigate student achievement outcomes and leverage student achievement outcomes to improve teaching and or learning.

Schools and PLCs in schools expressed differing understandings of the collaborative culture and the educator inquiry process for problem solving. Schools with shared leadership structures

shared decision-making processes. Schools and teachers used an action research process (Mills, 2010; Wilson, 2013) to assist teachers in PLC teams to determine where students were in their learning, why, and how teachers could draw, take and borrow teaching and learning experiences from one another to ensure student success. Moreover, as teachers shared information about learning, they also determined the best methods to ensure student learning when students had failed and therefore needed further remediation. The action research process was expressed to be part of the instructional culture (Deal & Petersen, 2010). The instructional culture was also part of the school improvement process that shaped the goals of administrators and teachers associated with teaching and learning systems.

Schools that shared leadership and decision-making also had very well established norms for participation. Schools, administrators and teachers viewed participation as forced because of PLC expectations but also suggested that more intellectual discourse, interaction, and communication ensured greater participation by every PLC group member. Teachers in particular expressed that participation in more physical interactions of the collaborative inquiry process provided greater parity of contribution. The greater parity of contribution by participants also ensured more emergent innovative teaching and learning activities.

Schools with little to no shared leadership or shared decision-making expressed greater anxiety from forced participation. Teachers expressed frustration and concern at the lack of direction (leadership) and opportunity to interact intellectually about their practice. Even though teachers had physical workspace to interact, the lack of leadership, shared decision-making, and parity of contribution resulted in less teaching and learning innovation emergence.

The accountability for the PLC and shared practice outcomes was a prominent theme expressed by participants. The PLC group members in all schools expressed anxiety about student achievement outcomes from standardized testing (CRT, NRT). Teachers were held accountable for student achievement in some schools more so than others. In one participating school, value added measures were put in place to motivate teachers to work harder in the teaching and learning process to help students increase achievement scores and therefore add value to their paycheck. At other schools teachers were counseled about low student performance where administrators made attempts to formally reprimand teachers for low scores to further motivate teacher work toward teaching and learning innovations. All of these processes were designed to promote increased student achievement outcomes but had not had the desired effects. Moreover the expressed anxiety resulted in a decrease in intellectual interactions and therefore sharing of teaching and learning innovations. Furthermore, the increased anxiety negatively impacted the collaborative inquiry processes forcing a decrease in physical interactions in the workplace, thereby increasing teacher isolation.

Participating schools and teachers that shared leadership and decision-making, expressed less anxiety about student achievement scores. Teachers and administrators worked collaboratively on shared leadership and decision-making for teaching and learning innovations that enriched student learning. These schools and teachers also expressed greater parity of contribution in goal setting and accomplishment thereby having a greater shared workspace where intellectual and physical sharing of teaching and learning innovations led to greater student achievement. Teachers and administrators in these schools also expressed greater emergence of teaching and

learning innovations in the shared workspace. The intellectual and physical discourse, interactions, and communications of the teachers in these groups expressed greater willingness to adopt shared teaching and learning innovations from one another in the PLC.

The intellectual and physical interactions from the collaborative inquiry process in PLCs created an expressed personal and professional closeness in the relationships of participants. Participants expressed greater parity of contribution, shared goal setting, shared decision-making, and greater emergence of teaching and learning innovations in the workspace. Participants stated that deeper intellectual interactions in the PLC provided opportunity to grow personal and professional relationships in the physical workspace primarily because of increased established trust. The more administrators and teachers worked closely together in the physical workspace to share teaching and learning innovations as a team, the closer and more accepting of each other's values and beliefs they felt.

The overlap between the intellectual and physical workspace greatly affected participant sense of acceptance. The lack of acceptance negatively affected intellectual interactions in the shared workspace. The lack of intellectual contribution then led to a lack of quality problem solving and collaboration. The frequency of physical and intellectual interactions grew participant shared values and vision and that grew to the acceptance one another's differences. Teachers suggested that the intellectual and physical interactions in the shared workspace where they had the opportunity to share values and beliefs provided opportunities to grow closer, and a more cohesive relationship with other teachers and administrators. The administrator from the campus suggested the intellectual discourse in the physical workspace grew a personal level of trust and respect for teachers while at the same time providing opportunities to grow together new and improved teaching and learning innovations:

> *I went from barely knowing people I work with to knowing how they operate in their classroom and why. That interaction, talking through our values and beliefs grew this sense of respect and appreciation for the person. I am not necessarily friends with all my colleagues but I value them as teachers and we know each other now. What is most interesting about our intellectual interactions are that now our students know we have these interactions in PLC and our common language, practice and goals are universal throughout our campus.*

All participants agreed that the collaborative inquiry process provided the emergence of teaching and learning innovations from shared intellectual and physical contributions to teacher learning from student achievement data. The sharing of information in problem solving why some groups of students fail and some groups of students succeed on assessments provided participants with the opportunity to discuss and come up with consensus with next teaching and learning innovations shared from their experiences as professionals.

The attributes and characteristics of professional learning communities overlap in the intellectual and physical shared workspace where teachers and administrators share information for the betterment of each participant and their students. The professional learning communities' goal as a school and as group of teachers working together is the emergence of shared leadership, goals setting, decision-making, teaching-learning-assessment innovations, and the accountability for

student achievement. The soft outcome of the collaborative interactions in PLC are the positive evolving relationships between participants. The successes and failures of collaboration in the shared workspace create a unique perspective on how and why PLCs are implemented to success or failure in schools.

The shared workspace is an interaction between the intellectual and physical contribution of group members that contribute to the characteristics of an effective PLC. The shared workspace is a product of intellectual and physical interactions of participants as the PLC group members strive to attain and satisfy the characteristics and attributes of effective collaboration. The overlap between an effective PLC, an effective school culture and effective collaboration provides a framework for the successful implementation of a PLC. The overlap in the characteristics and attributes of each provides functional qualities of a shared workspace. The attributes of effective collaboration and the characteristics of a positive school culture and an effective professional learning communities merge into the common workspace where teachers and administrators interact to solve problems as a team in the school improvement process through physical and intellectual interactions to solve problems that promote school improvement.

INSERT SHARED WORKSPACE DIAGRAM

The emergent framework of the shared workspace are a unique part of school culture. The framework provides schools, administrators and teachers the structure to align intellectual and physical contributions of professionals in the shared workspace that is the school as a learning organization. The school as a learning organization must be able to share leadership and decision-making leveraging the collaborative inquiry process and the intellectual and physical contributions of all group members. Participation must be voluntary and based on parity of contribution.

The group should then be able to share goal setting, make decisions about accountability measures, share practice and determine research based best-practice steps for each. The contribution of intellectual and physical workspace between group members provides the opportunity for the emergence of activities and products from a functional professional learning community.

Conclusions and Implications - The results of this study provide insight into a PLC and school culture as a blending of concepts to support current practice in schools. The five schools investigated are part of an ongoing investigation on PLCs and school culture. Schools, administrators and teachers provide a unique perspective on school culture and PLCs based on their intellectual and physical interactions in the shared workplace that are the professional learning communities in schools. This study is important in the continual development of the school as a workplace and learning organization.

The concept of the school as a workplace (Little, 1982; Martin, 2014; Senge, Cambron-McCabe, Lucas, Smith, & Dutton, 2012; Tam, 2015) points to the need for schools to leverage professional educators to work together as effective collaborators (Nelson et al., 2010; Riveros,

2012; Sinnema et al., 2011) to solve problems in schools as it pertains to effective teaching and learning (Carpenter, 2015; DuFour et al., 2008).

Despite the richness of the literature on PLCs, effective collaboration in schools and school culture, little research has proposed connections between them. The findings from this study are applicable in theory and practice for shaping a functional PLC, a positive school culture and organizational improvement of the school as a workplace. Schools, administrators and teachers should consider the applications of shared leadership, collaborative inquiry for instructional improvement and the sharing of the workspace components as part of an effective school culture.

Empirical research studies have shown great diversity in the successful implementation of PLCs as part of a school culture. It has been proposed here, as a function of the experiences of a select group of teachers in real schools, that PLCs fall short of reaching their design for school improvement. The reason for PLC failures are identified here in the lack of the implementation of key attributes of effective collaboration and or shortcomings in the implementation of the key characteristics of PLCs. Connections between the intellectual and physical contributions of group members, leveraging parity and emergence will ensure the newly proposed concept of the shared workspace provides a framework for the successful implementation of the PLC as part of a positive school culture.

This paper focuses on the connections between PLCs, school culture, and professional educator collaboration. This paper proposes to provide a unique model called the ***shared workspace***. The model combines the intellectual and physical aspects of group members to ensure the effectiveness of collaborative systems that promote quality practice in schools through functional PLCs as part of a positive school culture. This paper further offers extensions to the shared leadership concept (Carpenter, 2015) in how schools, administrators, and teachers should work together, thus more collaboratively through a continuous improvement process of the school as a workplace and a learning organization.

The concept of the shared workspace requires further development. The author continues to work with schools, administrators, and teachers to investigate conceptualizations of the intellectual contributions, the physical contributions, and the contribution to emergent teaching and learning innovations from them. The author also hopes to further investigate the collaborative inquiry process as a functional component of the school culture, realizing that it is not a stand-alone piece but as part of the continuous improvement cycle of a school (Carpenter, 2015) and its implications to the school improvement process. Each of these are functional components of a positive school culture and will further add to the theoretical and practical applications needed in schools as a workplace and learning organization.

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Shared Accountability
& Decision-making

Shared Goals

*Collaborative
Inquiry Process*

Shared Practice

*Intellectual
Contributions*

Parity & Voluntary in
Contribution

*Physical
Contributions*

Shared Leadership

Intellectual
Shared
Workspace

+

Physical
Shared
Workspace

Emergence of
Activities and
Products