Parking Lot Learning? An Examination of Teacher Informal Learning within a Knowledge Culture

by

Pamela Timanson

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Department of Educational Policy Studies
University of Alberta

Abstract

In this study, the author utilized a conceptual framework of knowledge cultures to investigate how teachers experienced informal learning. This study explored the interdependence between individual and social processes in teacher learning, examined how teachers co-constructed knowledge, and investigated the impact of infrastructure and the wider context on teacher learning. This study employed interpretive inquiry from a sociocultural perspective (Ellis, 2006; Packer & Addison, 1989). Data were collected over a period of five months, and included observations, informal, and semi-structured interviews of four high school teachers in an urban setting. The significant findings reported are: the participants experienced informal learning in many ways but learning from mistakes during experimental or trial and error processes and learning informally with students were novel experiences for these participants. The participants' short-term learning loops involved the collaborative and reflective processes of problem solving and brainstorming rather than a heavy reliance upon knowledge objects. A significant outcome of this study was the characterization of the teachers' knowledge domain, in terms of how they shared tacit knowledge through their informal learning processes, and the unique dimensions of teacher knowledge and how it was managed. The wider context of teacher informal learning had prevalent formalization structures that entangled with their informal learning and affected the participants' collaborative learning in terms of time restrictions for the professional learning communities and their conversations, and reduced professional autonomy in the decision making process for these communities and of their learning. This greatly impacted the teachers' professional learning and inhibited the potential of this learning.

Keywords: teacher informal learning, teacher professional development, knowledge culture, teacher knowledge

Preface

This thesis is an original work by Pamela Timanson. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "TEACHER INFORMAL LEARNING", No.00034031, January 21, 2013.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

OECD – Organization for Economic Cooperation and Development

AISI – Alberta Initiative for School Improvement

PLC – Professional Learning Community

PD – Professional Development

IPP – Individual Program Plan

PIA – Pre-interview activities

EAs – Educational Assistants

CTS – Career and Technology Studies

K & E – Knowledge and Employability

GLOSSARY OF TERMS

Informal workplace learning – everyday life learning that lacks the boundaries of a classroom or workshop and occurs between colleagues and within the work community, work processes, and activities.

Knowledge cultures – are a part of the social life within a workplace. It is the way employees envision knowledge, in terms of its character, outreach, and opportunities. Each profession has their own knowledge culture that has unique ways of producing knowledge based on the culture of their workplace, methods of production, artifacts and tools, and traditions that they use within their workplace.

Learning – a knowledge producing process, in which members of a workplace community generate knowledge through their active participation in the workplace (Fenwick, 2010).

Chapter 1 - Parking Lot Learning? An Examination of Teacher Informal Learning within a Knowledge Culture

Within schools, we are currently facing challenges with meager knowledge transfer from formal learning sessions and with changes to school staff personnel as the impending baby-boomer retirement looms (Canadian Council on Learning, 2007). We are also continuing in our race to improve our schools and ensure that our high school completion rates are increasing (Alberta Education, 2012). The workplace learning of our teachers is seen as a key factor to improving schools and being the direct influence on getting students to achieve at higher levels. As a result, for 13 years the Alberta government was fiscally responsible for the Alberta Initiative for School Improvement (AISI) policy. The Alberta government invested over $600 million dollars to support the approximately 1600 AISI projects that all "provincially funded school authorities" had participated in at some point (McQuarrie & McRae, 2010, p. 3). This was their attempt at improving student achievement and increasing high school completion rates, and managing and developing accountability within the education field. AISI projects were described as being collaborative in nature and completed within the professional community of the school. AISI was one of the Alberta government's first big steps to addressing the impending baby boomer retirement and the resultant workforce changes.

This study addressed teacher workplace learning within the current Alberta policy context and explored teachers' perceptions of their learning within their knowledge culture. A knowledge culture is the unique way teachers produce knowledge within the culture of their workplace, in terms of their methods of production, artifacts and tools, and traditions that they use within their workplace. This study is of great importance because it is timely in the fact that schools have been operating as learning organizations for quite some time and teachers will have

had time to implement and adapt to the AISI policy initiatives. This study generated interpretations that are very useful for policy makers as they continue to create policies to address adult learning, to adjust to the baby boomer retirements, and to ensure that the millions of dollars spent on teacher workplace learning are wisely spent as opposed to relying on traditional practices. This study also added much needed research to the understandings of informal teacher learning. Although there has been some recent research on informal learning in the workplace, there has been a paucity of studies that explored this phenomenon for teachers. This study emerged from a combination of two research perspectives, one that originated from the literature on adult education and workplace learning, and the other that came from teacher professional development. This study combined perspectives from workplace learning and teacher professional development to explore teachers' perceptions of their learning within their knowledge culture.

Background

As with other organizations in the 1990s, schools were also strongly encouraged to become learning organizations. In a school-based learning organization, teachers ponder together on how to solve problems that surface around teaching and learning and learning networks are established to provide teachers with the opportunity to talk and deliberate with each other (Schechter & Feldman, 2010). A school "develop[s] innovative structures and processes that enable them to develop the professional capacity to learn in, and respond quickly and flexibly to, their unpredictable and changing environments" (Giles & Hargreaves, 2006, p. 126). A school-based learning organization strives for continual improvement through their communities and teachers within these communities see the connections between intra- and interpersonal learning and the importance of an organization learning collectively in order for their school to be able to

change and succeed (Giles & Hargreaves, 2006). As in other organizations, schools are encouraged to shift away from the traditional, individual, and isolated learning to learning that is collective and interdependent (Collinson, 2008). The most prevalent and popular way that a school demonstrates transition to becoming a learning organization is in the creation of communities of practice or professional learning communities, which emphasizes the tradition of social processes of organizational learning. This has resulted in professional communities becoming the "new signifier for educational change" and increasing in popularity as the "new 'orthodoxy' in which different collaborative discourses are incorporated" (Lavié, 2006, p. 794).

In 1999, the Alberta government and five of its educational partners (Alberta Teachers' Association, Alberta Home & School Councils' Association, Alberta School Boards Association, Association of School Business Officials of Alberta, and College of Alberta School Superintendents) created AISI as "an extension of Alberta's accountability framework" (Alberta Education, 1999). AISI was designed to be an innovative "approach to supporting the improvement of student learning and performance" within Alberta schools by encouraging a professional collaborative process between teachers, parents, and the community (Alberta Education, 2010). It was the means in which Alberta schools would be operating as learning organizations. AISI was implemented from 2000-2013 and functioned on a three-year cycle. AISI was seen as a catalyst for change that is flexible, reflective, evidence- and research-based, and most importantly, that is focused on student learning, creating a culture of continuous improvement (Alberta Education, 2009).

A central component of AISI was the professional development of teachers, where teachers were participating in both formal and informal modes of learning. Teachers were primarily encouraged to attend formal workshops or conferences such as the annual AISI

conference or an ATA specialist council conference. Teachers were also strongly encouraged to participate in professional learning communities (PLCs) where they were able to collaborate with their colleagues, both of which are examples of informal learning. A premise of AISI is that collaboration was to occur not only between the school and their parents and community, but also amongst teachers to ensure that student learning would be improved (Alberta Education, 2010).

Our province is not the only supporter of communities or networks as other countries such as New Zealand, England, and Finland also have policies that mandate for networks or professional learning communities (Strathdee, 2007; Webb, Vulliamy, Sarja, Hämäläinen, & Poikonen, 2009). Global agencies such as the OECD (Organization for Economic Cooperation and Development) and the United Nations are also strong supporters of networks, as they believe that "network creation can enhance economic and social outcomes" (Strathdee, 2007, p. 22). However, Coburn and Russell (2008) argued, "the existing research [to support the above claims] provides limited insight into the mechanisms by which teachers' professional relations represent a resource for instructional improvement" (p. 205). There is little concrete evidence into whether instructional change can directly result from the participation in a professional community (Coburn & Russell, 2008). It is assumed that by establishing and working collaboratively together in communities or networks, the learning of teachers will be automatic (Block, 2002) and teachers will improve their pedagogy and as a result, this will then lead to school improvement and an increase in the standards of student achievement (Coburn & Russell, 2008; Luke & McArdle, 2009; Strathdee, 2007; Webb et al., 2009). In this regard, teacher professional learning is characterized as occurring within a *black box* because their learning is

outcome based (Friedman, Lipshitz, & Popper, 2005) and not much is known of their learning processes within the professional learning communities of their school.

Levine (2010) and Westheimer (2008) continued the argument for clarifying how teachers learn within their professional community. They both argued that there is a need to strengthen our research on teacher community and learning in order to enhance our school improvement abilities. Ludvigsen, Lund, Rasmussen, and Säljö (2011) claimed, "if we do not understand how learning as specific activities are enacted, we simply cannot understand why and how people learn in different settings" (p. 5). If we are not able to understand why or how teachers learn within their knowledge culture, then our school improvement abilities will never reach their full potential.

Parding and Abrahamsson (2010) furthered the argument for the need to understand teacher learning, since they claimed that learning does not have a central role in the research on professions and that this is an area that requires much more attention. Wilson and Berne (1999) characterized that the research on teacher learning is incoherent and muddled and that "we have little sense… of what exactly it is that teachers learn and by what mechanisms that learning takes place" (p. 174). Coffield (2000) used the visual of an iceberg to symbolize the balance of formal and informal learning at work and argued that two-thirds of the iceberg is informal but is hidden from view and, therefore, called for much needed research to be conducted on the informal learning processes. Hodkinson and Hodkinson (2005) furthered this argument in their assertion that there have been very few attempts to combine the research on teacher professional development and informal learning and that "the teacher development literature has not yet fully come to grips with the significance of everyday working practices for teacher learning" (p. 110).

They contend that in order to reveal how learning is enacted within the professional communities of teachers, the two strands of research need to inform each other.

Since there is insufficient research on teacher informal learning, there is a fervent need to examine the existing assumptions surrounding teacher collaboration and learning, and to investigate the learning processes that are occurring within the professional communities of Alberta schools. It is necessary to explore the impact teacher collaboration has on a teachers' teaching practice and how the informal learning processes of teachers are enacted so we can gain a better understanding of how teachers learn within their knowledge culture. As such, this study will illuminate the black box of teacher learning and expose the dynamics of their informal learning.

Problem Statement

The problem, then, is that the specific informal learning mechanisms of teachers within their knowledge culture have been under researched. This interpretive study provides insight into the mechanisms and tools of a teacher's workplace that facilitate the co-construction of knowledge between teachers and the impact of infrastructure, professional relationships, and practices on teacher learning.

The Research Question

The research question for my study was *how does a teacher experience informal learning*? The sub-questions of my study were:

1. How does a teacher perceive her informal learning mechanisms within her professional community and what is the impact of this on her teaching practices?
2. What is the interdependence between formal and informal learning and individual and social processes in teacher workplace learning?

3. What are the mechanisms and tools of a teachers' workplace that facilitate the co-construction of knowledge between teachers?
4. What is the impact of infrastructure, professional relationships and practices on teacher learning?

Significance of my Study

My study addressed the following societal concerns: (a) the impending baby-boomer retirement that will generate change within the workplace of many professions, including teaching. This means a considerable amount of tacit knowledge will leave the workplace and "Canada [will] face declines in the availability of experienced and knowledgeable workers in the labour force" (Canadian Council on Learning, 2011); (b) only a miniscule percentage of knowledge gained in formal training or development sessions is transferred back to the workplace (Taylor, 2000; Merriam, Caffarella, & Baumgartner, 2007); (c) companies spend billions of dollars annually on the workplace learning of their employees in terms of the learning opportunities they provide to their employees or the training workshops they are sent to (Taylor, 2000); (d) Canada continues to lag behind our OECD international competitors in many stages of education and learning, and is currently faced with a learning paradox, where employers and employees acknowledge the significance of learning but are foregoing learning opportunities (Canadian Council on Learning, 2011).

My research provides understandings of how teachers are learning informally within their workplace, which will inform policy makers as to how knowledge is created and transferred between adults so that they may develop "coherent and effective policies targeted to the specific learning needs of adults" (Canadian Council on Learning, 2011, p. 30). These understandings will help schools to address the impending change generated by the baby-boomer retirement, the

meager knowledge transfer from formal professional development sessions to the workplace, and the learning paradox of teachers foregoing learning opportunities. Having a better understanding of how teachers are learning within their workplace, will also guide school administrators in their decisions on what type of learning opportunities to provide to their staff and on where and how to spend their allotted professional development budget.

Delimitations

I chose an urban high school outside of Edmonton because I was a teacher within one of the Edmonton school boards and I did not want to complete my research within this same context. Upon consideration, I chose to interview high school teachers instead of elementary or junior high teachers because they provided a better opportunity of observing teachers learning within the knowledge culture of their department and school. I was able to observe the teachers' individual learning in relation to their department and the learning orientation of their school. Elementary and junior high schools typically do not have departments and I would not have been able to get those different perspectives within a smaller school.

I did not investigate formal learning, the typification of informal learning activities within a professional community, nor did I evaluate the effectiveness of teacher professional development activities the teachers partook in. Further, professional learning communities, how the professional community was established, or its effectiveness were not studied. I also did not study the implementation of the AISI policy, the role administrators played in the workplace learning of the teachers, nor the conceptualization of teacher learning through a literature review.

Limitations

I recognized that in the interview process, the teachers may have felt the need to respond to my questions in a particular way so that they could provide the answer they thought I was

looking for. They may also have felt like they could only tell me an edited version of their response, where they chose to leave out parts of their response, because they were scared of revealing too much information or information that is of a sensitive nature. There was also the potential for a participant to fabricate or embellish a response or parts of a response. The interviews were transcribed and there was the potential for the tone of voice or stylistic nature of the participant to be lost from the transcripts. The design of my study was also limited in that I was also not able to interview and observe all of the teachers within each of the departments or throughout the school. This limited my data in that I only gained snapshots of teacher learning within this knowledge culture through an individual perspective. It is limited in that observations occurred periodically, which led to the potential for me to miss other interactions or learning that happened when I was not in the school.

The Researcher

I have been a high school science teacher in Alberta for almost 11 years. I have taught a few junior high science classes but have primarily spent my time teaching high school biology and chemistry. My teaching background is relevant to my study because I have first hand experience of learning within a high school both at the department level and at the school level. I also have experience teaching and learning under the AISI policy framework. This allowed me to relate to my research participants and develop trust with them. It also allowed me to have a better understanding of the day-to-day practices a teacher enacts.

I completed my Master's degree on Workplace and Adult Learning and was introduced to the concept of informal learning and the lack of understanding there was in teacher informal learning. The research I completed in my coursework spurred my interest to pursue this as my doctoral research question because I wanted to learn more about the learning processes teachers

experience in their workplace. I believe informal learning is very valuable for teachers but there is little research available to support this type of learning or to encourage government officials to spend more money on providing teachers with more opportunities to learn within their workplace or to learn in alternative ways. Interpretive inquiry calls for a researcher to have a firm understanding of their perspective or horizon, which is their beliefs, ideals, prejudices, and biases (Ellis, 1998b). From my own personal teaching experience, the learning I experienced at my workplace and with my colleagues was infinitely more valuable than what I experienced at formal workshops. It was also, and still is, my preferred mode of learning. This bias towards informal learning may have influenced the perceptions I took into the data collection process but through self-reflection on my thoughts and feelings towards formal workshops, the conversations I had with my colleagues and classmates, and my reflections on the teacher learning literature, I was aware of my biases and was aware that other teachers have different perceptions of what their learning is like in their workplace and that they may value and learn in other ways, and may not value or like to learn informally or in the ways I did. The goal of my study was not to prove my beliefs about informal learning but rather it was to determine how other teachers perceived their learning experiences at work. I explored what they valued in their learning and how their values of learning intersected with the learning values of their school.

Organization of the Thesis

In the next chapter, I provide a literature review on workplace learning, formal and informal learning, teacher professional development, collaboration, community of practice, sociocultural theory, and the social construction of knowledge. I explore various empirical studies that have been completed on informal learning in other organizations outside of education and those that have been completed on teacher informal learning. To conclude the

chapter, I discuss knowledge cultures and provide a review of empirical studies that have been completed in this research area. I also explain my conceptual framework and how it allowed me to explore my research questions with support from the literature review.

In the third chapter, I provide details on the methodology that I used in my study. I begin with a description of the constructivist paradigm and then proceed to explain interpretive inquiry and the central ideas of hermeneutics. I then expand on interpretive inquiry and demonstrate how this methodology allowed me to investigate my research questions. I also provide detail on the methods I used to complete data collection and analysis.

Chapter four includes a description of the research context and characterization for each of the participants. This characterization of the context and the participants provides background on the school and school district and insight into how the participants perceived and understood their learning. In the latter part of the chapter, I briefly describe the analysis framework used and then provide analysis of the data collected and discussion of how the participants experienced informal learning.

Chapter five consists of an examination of teacher informal learning in the participants' social learning environments. I describe the observations made of the participants during PD days and their PLC meetings. I also explain the common themes that emerged from this data, along with a further examination of some of the themes identified in chapter four. I conclude the chapter with a synthesis of the interdependence between the individual and the social in the informal learning processes of the participants and the impact this has on their co-construction of knowledge.

In chapter six, I discuss the findings and interpretations from my analysis and reflections on the research. I begin with a discussion of the knowledge culture studied in terms of teacher

informal learning and the impact it had on the participants' teaching practice. I then explore the interplay between formal and informal learning and the influence this had on the teachers' informal learning. To conclude the chapter, I discuss the heuristic practices of the knowledge culture with an examination of tacit knowledge, their inquiry practices of validation, legitimization, and documentation, their collective way of knowing, and how they envision, accumulate, distribute, and access knowledge.

In the final chapter, I conclude my thesis with a reconceptualization of teacher informal learning within a knowledge culture. I discuss the research questions for this study through integration of the analysis, interpretations, and synthesis of the characteristics of the knowledge culture. I then provide consideration of the implications and recommendations for theory, policy, practice, and future research, and final reflections on the study.

Chapter 2 - Literature Review

Currently, there is a paucity of research into teacher professional learning and researchers are not sure how teachers are learning from each other within their workplace. In this study, I explored how teachers perceive and understand their informal learning mechanisms within their knowledge culture and the impact this has on their teaching practice. I sought to uncover and develop an understanding of the interplay between the formal and informal learning of teachers and the individual and social processes in teacher workplace learning. My research allowed me to provide further insight into how the mechanisms and tools of a teachers' workplace facilitated the co-construction of knowledge between teachers and the impact of infrastructure, professional relationships, and practices on teacher learning. This study provided much needed research and insight into an area that is scant with profundity.

In this chapter, I provide a literature review that supports the purpose of my research. I begin with a description of workplace learning and explain how formal and informal learning are described in this literature. From here, I explore teacher professional development in terms of traditional and progressive practices, and then review the literature on teacher professional learning, and formal and informal learning. I then move into a discussion of collaboration, communities of practice, sociocultural theory, and the social construction of knowledge. I conclude with an explanation of my conceptual framework and demonstrate how the concepts in the literature review are framed and understood within knowledge cultures, and how it connects to the research questions in this study.

Workplace Learning

In this study, two strands of research, workplace learning and teacher professional development, have been linked to reveal how learning is enacted within the professional

communities of teachers. The literature review begins with an examination of workplace learning and progresses to an overview of knowledge and learning, and two learning processes pertinent to this study, formal and informal learning. To conclude the first section, I provide an overview of the relevant empirical studies on informal learning and explain the necessity for studying teacher informal learning in light of the research that has been completed.

Workplace learning is one of the constituents of adult education and is an important area of research to merge with the literature on teacher professional development because it incorporates adult learning theories and andragogy into the daily work practices of adults. There is an emphasis in the literature on workplace learning that adults are learning on a continual basis within their workplaces (Billet, 2001; Rothwell, 2002). The literature on teacher learning has focused primarily on the development of teachers where a majority of the research is conducted on the most effective ways of delivering professional development to teachers. Teacher workplace learning has not been studied to the extent that is needed and this research is necessary since teachers are adults that are also learning on a continual basis within their workplaces. What workplace learning perspectives bring to the field of teacher professional development is an explicit focus on processes as opposed to content or structural focuses.

A keen interest in workplace learning was stirred up in the 1990s when Peter Senge (1990) encouraged companies to recognize the importance of becoming a learning organization in order for them to become more competitive in the global markets. A learning organization, as defined by Easterby-Smith and Lyles (2005), is “an ideal type of organization, which has the capacity to learn effectively and hence to prosper” (p. 2). It is “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually

learning how to learn together" (Senge, 2006, p. 1). Having employees "who [can] think, work together, challenge each other, and innovate" (Forman, 2004, p. 2) resonates the importance of team learning in a competitive organization (Rothwell, 2002).

Companies are encouraged to look at learning not only as an individual effort but more in terms of group or team efforts, since "the whole [of a company] is greater than the sum of its parts" (Forman, 2004, p. 3). Since "learning takes place among and through other people" (Elkjaer, 2005, p. 43), companies who invest in human and knowledge capital encourage both the development of their enterprise and the development of their employees. They are a step ahead of their competitors, providing them with the potential to make more money and become more powerful (Boud, 2003; Forman, 2004; Merriam et al., 2007; Rothwell, 2002).

Workplace learning is defined as a "change that people undergo as they prepare to perform their work, as they carry out their work, or as they reflect on their work experience" (Rothwell, 2002, p. 8). Further to this, Billet (2001) explained, "workplaces structure and routinely provide learning experiences as part of everyday work activities and through guidance from other workers" (p. 14). Learning in the workplace also provides employees opportunities for praxis, where they take the knowledge gained in a workshop or during their postsecondary training and apply it to their work (Boud, 2003). Employees are embedded in a work environment in which they can co-construct knowledge with other employees, relating personal and work experiences to factual information. When workplace learning is dynamic, allowed to evolve, and workers are not regimented with set knowledge, Carter and Francis (2001) affirmed:

> Workplace learning is a powerful source of learning and change in individuals, groups and organizations. When workplace learning is grounded in a constructivist epistemology

> it has the capacity to generate a dynamic, interactive learning process that has the potential to challenge if not transform the status quo. (p. 251)

Workplace learning has the potential to allow employees the opportunity to grow as professionals, deepening their knowledge base through interactions with their colleagues.

Learning in the workplace exemplifies situated cognition in that employees are not able to "separate the learning process from the situation in which the learning is presented" (Merriam et al., 2007, p. 178). By participating in the work community, employees incorporate the artifacts of their workplace, their experiences, and the interactions with others in their learning processes. Members of the workplace community and their associated artifacts or objects cannot be thought of as separate entities because they are all inherent to the learning process (Merriam et al., 2007). The employee learning processes are not distinct or separate from the artifacts but are instead, intermingled and reliant on each other. In this regard, workplace learning involves a socially mediated cognitive process in which employees interpret and make sense of all of these variables (DeFillippi & Ornstein, 2005). Billet (2003) summated, "in this way, working is learning" (p. 51).

Tacit Knowledge and Learning

The premise for this study is focused on examining how teachers learn and generate knowledge with their colleagues. As such, gaining a better understanding of how the terms knowledge and learning are used within workplace learning literature is required. It is important to have a distinction between them and how they were defined and used in this study.

Knowledge. Although knowledge and information are often used interchangeably, there are distinctions between them. Information tends to have a factual basis and is more ubiquitous than knowledge; it is characterized as being a flow of messages (Chakravarthy, McEvily, Doz, &

Rau, 2005). Knowledge on the other hand is created; it is a form of understanding or awareness that exists at a particular time and is generated through reflection and abstraction (Chakravarthy et al., 2005). Information is often built into knowledge but it takes time, critical discourse and reflection (Biesta & Burbules, 2003; Boyles, 2006). As such, information is a part of superficial knowledge, which is readily available and associated with rote learning and a lack of critical discourse. Deep knowledge is a result of a knowledge construction process and relies upon reflection, action and abstraction (Biesta & Burbles, 2003; Chakravarthy et al., 2005).

Research within organizational learning and learning organizations has branched to focus on organizations' knowledge management practices (see Baumard, 1999), and an area of study within this realm has been on the different forms of knowledge. Tacit knowledge is a form of deep knowledge where employees have an innate understanding of their work and know how to complete it. It is deeply familiar to them and when asked to explain how they do what they do or know what they know, employees have a hard time articulating an explanation (Tsoukas, 2005). They lack conscious access to it (Grandinetti, 2014). Polanyi was the first to use the term, tacit, and his work was foundational to knowledge management research. Polanyi (1962) used the example of a cyclist being able to balance on a bike but not knowing how she was doing so. She may have been able to describe how she positioned her body and leaned a particular way when going around a curve, but she might not have been able to explain the rules or the science of momentary direction, velocity, and her inner ears behind her balancing ability. In this sense, Polanyi (1966) explained, "we can know more than we can tell" (p. 4). Competence is achieved when we become unaware of how to do something and are able to select pieces of knowledge that are pertinent to a particular situation. We can complete our daily work without having to

think through every single step of how to do it. In this sense, knowing something is fundamentally connected to action and is always contextual (Tsoukas, 2005).

Nonaka and Takeuchi (1995) furthered Polanyi's work on tacit knowledge and popularized it in management studies. They coined the term *knowledge conversion* and described how through human interaction, knowledge is transferred between tacit and explicit knowledge. Nonaka and Takeuchi defined tacit knowledge as knowledge that is not yet articulated (it is awaiting conversion/translation) and explicit knowledge as knowledge that is articulated. From their study of a software developer, Tanaka, they described four modes of knowledge conversion: tacit to tacit (socialization; occurs through observation, imitation, and practice), tacit to explicit (externalization; articulated in the form of concepts, models, hypotheses, metaphors, and analogies), explicit to explicit (combination; combine different bodies of explicit knowledge), and explicit to tacit (internalization; individuals absorb knowledge through reflection). In this sense, knowledge can be formulated and transferred from one employee to another.

Nonaka and Takeuchi's conceptualization of knowledge transfer presumes that employees will be able to articulate what they know; their tacit knowledge is definable, as they will be able to figure out the rules and communicate them to their colleagues. This is at odds with Polanyi's understanding of tacit knowledge and has such been critiqued (see Grandinetti, 2014; Tsoukas, 2005). Polanyi did not distinguish between tacit and explicit knowledge, because to him tacit knowledge is impossible to articulate (Grandinetti, 2014). Tsoukas (2005) argued, "skillful knowing contains an ineffable element; it is based on an act of personal insight that is essentially inarticulable [*sic*]" (Tsoukas, 2005, p. 424). Tacit knowledge in this sense then, is not definable and cannot be easily transferred from one employee to the next. A more current

critique of Polanyi's work is his lack of consideration for social learning processes. Socialization needs to be considered since employees are learning from their observations of their colleagues and more importantly, through the guidance of their colleagues within a workplace. As such, "tacit knowledge cannot be 'captured,' 'translated,' or 'converted,' but only displayed and manifested, in what we do. New knowledge comes about not when the tacit becomes explicit, but when our skilled performance is punctuated in new ways through social interaction" (Tsoukas, 2005, p. 410).

Learning. Fenwick (2010) argued that the term learning has been used in several different ways throughout the literature on workplace learning. In her meta-review of workplace learning research published in journals from 1999-2004, she determined eight categories of how workplace learning was described and argued that hardly any of the authors explicitly defined what they meant by learning. For the purposes of this study, learning is defined as a knowledge producing process, in which members of a workplace community generate knowledge through their active participation in the workplace. The members of the community both influence, and are influenced, by the social and cultural factors of their workplace. Fenwick (2010) stated there is "mutual interaction and modification between individual actors, their histories, motivations and perspectives, and the collective (including social structures, cultural norms and histories, other actors)" (p. 84). There is an enmeshment of the individual and social processes, and the artifacts or objects of a workplace may play an important role as mediating agents in this process (Fenwick, 2010). In their knowledge production processes, employees may use the tools and texts within their workplace to help them accumulate, distribute, or apply knowledge. The creation of new knowledge occurs through a collaborative process and centers on shared knowledge objects (Damsa, Kirschner, Andriessen, Erkens, & Sins, 2010).

Formal Learning

Within the workplace learning literature, there are two learning processes that are relevant to this study, formal and informal learning. Formal workplace learning is the most popular choice for learning organizations and occurs when employees attend training sessions/workshops, a conference or enter an educational institution to gain more knowledge in a particular area (Merriam et al., 2007; Ricou, 2015). There is a top-down approach in which an expert provides information, skills or artifacts to the employees attending the training session or class (Candy & Matthews, 2003; Manuti, Pastore, Scardigno, Giancaspro, & Morciano, 2015; Merriam et al., 2007). Formal training sessions are short-term change efforts designed to equip employees "with the knowledge, skills, and attitudes they must possess to be successful in their work" (Rothwell, 2002, pp. 6-7). There is an "absence of action [as] learners are removed from the day-to-day work to engage in lectures, discussions, simulations, role-plays, and other instructional activities" (Enos, Kehrhahn, & Bell, 2003, p. 370). Employees most often leave their workplaces to attend the formal learning sessions at another location or are isolated in a different part of the building. In other words, it is necessary for employees to be apart from their normal work environment in order for learning to occur.

Informal Learning

Informal learning is defined as the everyday life learning that we all experience (Merriam et al., 2007) or more specifically, as a social process where there is integration of action and interaction that exists in order to build a domain knowledge (Enos et al., 2003). Enos et al. further characterized informal learning as a transfer process, using a law of exchange, where "a learner gathers new knowledge from its implementation, which in turn is used for future applications" (p. 381). They stipulated that it "occurs in the presence of both action and

reflection" (p. 370). Informal learning is also defined as "spontaneous learning [that] develops from multiple sources and in multiple contexts through interaction within communities of practice" (Jurasaite-Harbison, 2009, p. 301). It is learning that is intentionally organized, embedded in work processes and occurs through work activities (Hoekstra, Korthagen, Brekelmans, Beijaard, & Imant, 2009).

Eraut (2004) built on these definitions in his description of informal learning as providing a greater flexibility for learners or a larger capacity for individual agency, as it can take place in a much wider variety of settings. He explained that it is "a combination of learning from other people and learning from personal experience" (p. 248). Informal learning is often "regarded as being 'part of the job' or a mechanism for 'doing the job properly' and is thus rendered invisible as 'learning'" (Boud & Middleton, 2003, p. 195). Eraut (2004, 2007) characterized informal learning as being implicit (learning from experience), reactive (opportunistic learning), and deliberative (work-based learning activities). It has further been characterized as intentional (i.e., mentoring, networking) and unintentional (i.e., occurs through daily social interaction) (Berg & Chyung, 2008; Malcolm, Hodkinson, & Colley, 2003; Manuti et al., 2015; Ricou, 2015). Informal learning lacks the confines of boundaries that characterize formal learning and can be implemented in many different ways.

Informal learning activities in the workplace encompass a variety of different methods. These include mentoring, networking, coaching, self-directed learning, performance planning, trial-and-error, incidental learning, and socialization or tacit learning (Enos et al., 2003; Forman, 2004; Merriam et al., 2007; Ricou, 2015). Workplace activities can also be directly or indirectly guided. For example, Billet (2001) categorized a senior employee explaining something or providing a *trick of the trade* to a newer employee as a direct guide. The senior employee is

acting as a model or coach in which they are explaining their expert knowledge to the new employee and in their "ability to guide, organize and support" the learning of the new employee (Billet, 2001, p. 79). Indirect guidance is when employees observe and listen to other employees, picking up "models, cues and clues" within their work environment (Billet, 2001, p. 82).

Most of the activities associated with informal learning are collaborative in nature in which employees are working with each other to construct knowledge. Collaboration involves employees volunteering to work together to achieve a common goal through shared problem solving (Billet, 2001). Forman (2004) contended that employees "need to work together, share information, and exchange perspectives" in their collaborative activities (p. 4). As Billet (2001) further argued, "such collaboration is invaluable by making accessible to learners what they might not be able to learn alone" (p. 19). A collaborative group effort has been found to be more effective and appropriate for workplace learning than a traditional, individualistic style as seen in formal learning (Hayes, 2001). Quite commonly in workplace learning, this collaboration is referred to as occurring in a community of practice.

Empirical studies. The study of informal workplace learning has taken on a few different forms in the literature. Enos et al. (2003) aimed to expand and contribute to the theoretical framework for understanding the transfer of learning and the role of informal learning in the workplace from a managerial perspective. The authors used a one-group descriptive survey method for their study, in which they had a select group of managers complete a self-report questionnaire. They then analyzed the data summarized from the questionnaire to examine the relationships between managerial proficiency, the methods used by managers to develop this proficiency, transfer of learning, and the transfer climate in the workplace. Enos et al. provided a valuable framework on informal learning and transfer of learning both in terms of rationale and

techniques. Enos et al. (2003) encouraged future research to focus on "developing a better understanding of transfer climates that promote the transfer of skills learned informally" (p. 384). In my research, I developed this understanding through an analysis of teacher knowledge cultures, in terms of how teachers produced and transferred knowledge within their knowledge culture. My research provided a better understanding of the transfer climates for teachers.

Boud and Middleton (2003) investigated the informal learning of workers that were a part of a community of practice within an organization. The purpose of this study was to recognize who was involved in learning within this workplace and the ways these workers were learning informally. The authors used the methodological approach of semi-structured interviews and a social network analysis. From their analysis, the authors provided three significant ways informal learning is occurring and that the learning experience of the workers is strongly influenced by the nature of their work and the flow of information between the different workgroups. Boud and Middleton encouraged future research to develop more conceptualizations to help elucidate the processes of learning. My research addressed this need through the use of knowledge cultures to frame my analysis of how teachers are learning from each other. This conceptual framework will be explained in the last part of this chapter.

Through the critical examination, across a number of research projects that incorporated a methodological approach of interviews and short observations, Eraut (2004) provided a comprehensive deconstruction of the concepts of informal learning. The paper built upon a previous theoretical paper (Eraut, 2000) and explained a range of terms used in the literature on informal learning. In this paper, Eraut addressed three questions: what is being learned, how is it being learned and what factors affect the level and directions of learning effort. The article provided an extensive look at learning in the workplace and drew support from a wealth of

literature. Eraut also imparted an eminent understanding of the limitations and neglect surrounding informal learning. This article is fundamental to the research field on workplace learning and really progressed how informal learning was conceptualized in workplaces. Eraut claimed the impact of strengthening informal learning to develop the individual and collective capabilities of employees is not understood very well.

Eraut (2007) again built on the research study reported in 2000, where the same three questions were addressed but the third question, what factors affect the level and direction of learning efforts, was tailored towards new employees that were recent graduates (three years or less) of a postsecondary institution. Eraut provided a typology of the different work processes, learning activities, and learning processes that occur in early career learning, and confirmed that a majority of learning for workers occurs within the workplace. This paper added more detail and depth to his previous studies.

As with other organizations, schools were also encouraged to become learning organizations and shift away from traditional, individual learning to learning that was more collective and interdependent (Collinson, 2008). As such, there has been a strong push for schools to form PLCs, particularly under the AISI policy (Alberta Education, 1999). Ostensibly, the informal learning for teachers has been strengthened since they are working and learning collaboratively with other teachers. However, there has been little research done to explore if in fact learning is occurring and how teachers are learning from each other, which is what Eraut is alluding to in his claim.

There are two other studies that have provided significant understandings to informal learning. Livingstone (2001) provided a conceptual paper on informal learning where he completed an extensive literature review in order to understand the various conceptions of

informal learning and of the relevant empirical research that has been conducted on informal learning. Livingstone also identified areas for future research with a particular focus in Canadian contexts. He argued that further exploration is needed on the "largely hidden informal dimensions of the iceberg of adult learning" (p. 30). Malcolm et al. (2003) completed an extensive literature review and a historical and conceptual analysis of the terms formal, informal, and non-formal learning to gain an understanding of how these terms were being used (see also Colley, Hodkinson, & Malcolm, 2003). They concluded that all learning includes attributes of formal and informal learning and that they are interrelated in different ways depending on the context. The interrelationship between formal and informal learning influences the nature of learning within a specific context and as a result, the authors emphasized that it is necessary to examine the wider contexts in which the learning is occurring. My research addressed this gap in the research on teacher informal learning, as I have detailed the entanglements of formal and informal learning that influenced the participants' learning within their school.

Research into the informal learning processes of adults within their workplace has reinforced the importance of these learning processes and the many different ways these learning processes are occurring. Despite these significant contributions, there is still much to be learned about informal learning processes within the workplace, particularly in regards to teacher informal learning. Through an examination of the relevant empirical studies on informal learning, I have described the research gaps my study addressed.

Teacher Professional Development and Learning

In this next section, I explore the literature on teacher professional development and explain the differences between teacher PD and teacher learning. I then examine traditional and progressive teacher PD and their connection to teacher formal and informal learning. To

conclude, I provide an overview of the relevant empirical studies on teacher informal learning and explain the necessity for studying how teachers experience informal learning and the research gaps my study addressed.

Teacher PD is an ingrained part of a teacher's lifelong learning process. As part of their professional standards, teachers are required to participate in PD on a continual basis. Within Alberta, this is clearly stated in the Teacher Quality Standards document (Alberta Education, 1997). Teacher PD is often complimentarily linked with learning and it is important to have a distinction between the two. Teacher PD is defined as "a career-long process in which educators fine-tune their teaching to meet student needs" (Díaz-Maggioli, 2004, p. 5). It is a broad term that describes the holistic development of a teacher over the duration of her career (Bayrakci, 2009). PD focuses on the individual and is viewed as the main route for her professional growth, in terms of her skills, capabilities and knowledge (Bayrakci, 2009; Knight, Tait, & Yorke, 2006; Lom & Sullenger, 2011). It is assumed that if a teacher improves her teaching skills and pedagogical knowledge that she will teach more effectively and experience professional growth (Bayrakci, 2009). Essentially, PD is the context (Harris, Cale, & Musson, 2011) or "the process in which teacher learning occurs" (Lom & Sullenger, 2011, p. 57). It is the mechanism that school boards within Alberta use to provide a platform for teacher learning.

Kirk and Macdonald (1998) contended that teacher learning is "an active and creative process involving individuals in interaction with their physical environment and with other learners" (p. 377). This active learning process is influenced by past experiences, their existing knowledge and beliefs about teaching pedagogy, and their social and cultural context (Feiman-Nemser, 2008). "[T]eachers interpret new knowledge and experience through their existing beliefs and modify and reinterpret new ideas on the basis of what they already know and believe"

(Feiman-Nemser, 2008, p. 700). A teacher constructs new knowledge about pedagogical skills and the values and conceptions of different teaching practices (Lom & Sullenger, 2011). The learning process a teacher goes through is dialogical both in terms of her critical examination of new information and a re-evaluation of what she already knows, and in terms of the influence from/by the cultural and social factors of her workplace. Teachers produce knowledge through their active participation in their workplace and this process contributes to their overall growth both as a person and as a professional.

To summarize, PD is the plan or approach that is used to bring about teacher learning. Research on teacher PD has focused on the need to provide PD for teachers and on how teachers individually develop as professionals. In the late 1980s and early 1990s, teacher PD research characterized the practice of teaching and student learning as being situational, contextual, or ecological (Opfer & Pedder, 2011). In this time frame, researchers were arguing for PD to be provided to teachers and for teachers to be provided with opportunities to develop knowledge that was specific to their profession. Guskey and Huberman (1995) argued that teacher professional skills need to be renewed and that teachers should have the opportunity to learn about new reforms or developments within their profession. Borko and Putnam (1995) supported this argument, as they claimed that the role of PD is to allow for teachers to develop individual, subject-matter knowledge about the instructional strategies that inform their teaching practice.

Opfer and Pedder (2011) explained that in the late 1990s and early 2000s, following the push for school accountability and the need for more positivist research in teacher PD, "research on teaching and learning became more mechanistic and linear in response to the call for casual studies, effects, and the growth of linear statistical modeling" (p. 380). Teacher PD also became the backbone of school improvement initiatives and was linked to improving student

achievement. In 2003, Guskey completed a comparative analysis of 13 published lists of the characteristics of effective PD in order to gain a more holistic understanding of the effective PD practices, and how these can support administrators in their improvement initiatives. Guskey concluded that there was little agreement amongst the lists as to the criteria needed for effective PD programs and that the evidence used to support the criteria was often inconsistent and contradictory. He argued that a single list of effective characteristics is unreasonable for any administrator to expect. Instead, he encouraged administrators to consider the criteria in the lists along with their school context and students.

In recent years, the focus of research on teacher PD has reverted back to being situational, contextual, and ecological (Opfer & Pedder, 2011). There has been a shift away from viewing teacher PD as a solely individual process and more research is being conducted on the effectiveness of social processes in teacher learning. Studies are continuing to be conducted on the effectiveness of different PD programs and characterizations of effective PD practices, but have moved deeper in their analyzes and away from lists. Díaz-Maggioli (2004) described teacher PD programs as being traditional or progressive. Traditional approaches to teacher PD encompass more formal learning opportunities and are a continuation of the research based on the need to provide PD to teachers (Díaz-Maggioli, 2004). Progressive PD practices entail more informal learning opportunities and incorporate more of the literature on adult learning and the social processes of learning (Díaz-Maggioli, 2004).

Traditional Professional Development

Traditional PD is characterized by the following. There is a top-down decision-making process where the administrators decide the direction of teacher PD (Bayrakci, 2009; Díaz-Maggioli, 2004). There is also the idea that teachers need to be fixed when students are not

learning or when student achievement is not meeting targets (Díaz-Maggioli, 2004). The government focus for teacher PD is "on what teachers need to know and how they can be trained, rather than on what they actually know and how that knowledge might be expanded" (Bayrakci, 2009, p. 11). When PD programs are created, teacher voices are not included and as a result, the PD programs are not relevant to the specific classroom practices of teachers (Bayrakci, 2009; Díaz-Maggioli, 2004).

The traditional PD approach has a lack of variety in the modes of PD delivery and a tendency towards universal applications of classroom practices (Díaz-Maggioli, 2004). Quite often the cheapest and most economical format is chosen which is the one-size-fits-all approach or workshop mode. Although the administrators mean well, "the traditional and still prevalent practice of hiring an 'expert' to speak to a captive audience results in satisfying almost no one" (Bayrakci, 2009, p. 11). Of all the information that is provided at these workshops and training sessions, only a small percentage of information will be remembered and transferred to the workplace (Hunzicker, 2011; Taylor, 2000). This is because the PD programs that teachers are expected to implement take a considerable of amount of time to do so and there is also little or no support and follow-up communication provided to help teachers transfer knowledge from a workshop to their classroom practices (Bayrakci, 2009; Díaz-Maggioli, 2004).

Traditional PD practices also do not provide recognition to the career stage a teacher is at, many of the PD programs are not evaluated, and there is no account for the adult learning styles of teachers (Díaz-Maggioli, 2004). Traditional PD practices continue to dominate the approach that schools and school districts use for PD. Schools and school districts also continue to rely heavily on formal learning opportunities, as opposed to incorporating more informal learning opportunities as part of a teachers' PD.

Progressive Professional Development

A progressive teacher PD practice has many dimensions. It involves participatory and collaborative decision making between the administrators and teachers, where administrators seek input from the teachers to help shape the PD plan of the school (Bayrakci, 2009; Díaz-Maggioli, 2004). The administrators and teachers also try to find ways of linking a teacher's professional growth plan to the PD plan of the school. Progressive PD has a focus on individual teacher growth and teachers collaborate to create PD programs that are purposeful and specific to the needs of their classroom and school context. This would also be indicated in their professional growth plan and would help to ensure that there is a consideration for the personal needs, pre-existing beliefs, and prior experiences of teachers (Bayrakci, 2009; Hunzicker, 2011; Lom & Sullenger, 2011; Moyer-Packenham, Bolyard, Oh, & Cerar, 2011).

Progressive PD has an inquiry-based approach that allows teachers the opportunity of adopting tailor-made techniques into their teaching practice (Díaz-Maggioli, 2004). In the inquiry-based approach, teachers have the opportunity to reflect on their own teaching practice, experiment with new techniques, and to construct knowledge of their practice (Lom & Sullenger, 2011; Poekert, 2011). Progressive PD is job-embedded and provided in a manner that is flexible, varied, and timely (Bayrakci, 2009). It is flexible to meet the specific needs of a teacher, varied in terms of both informal and formal learning opportunities, and timely to meet the needs of specific students within a teacher's classroom. Teachers are actively learning in a variety of ways that are designed for adult learners and are able to construct knowledge that is pertinent to their pedagogical needs (Bayrakci, 2009; Chaudary, 2011; Eun, 2011; He, Prater, & Teneka, 2011; Hunzicker, 2011; Moyer-Packenham et al., 2011). Just as we focus on differentiated instruction

for our students, we need to ensure that adults also have the opportunity to experience a variety of learning opportunities to mesh with their individual learning styles.

Progressive PD incorporates adequate support systems to help teachers implement new programs or to transfer knowledge to their teaching practice. Support can come in the form of more time for both reflection and learning, internal support from other teachers and administration, and follow-up communication from a workshop facilitator (Díaz-Maggioli, 2004; Eun, 2011; Moyer-Packenham et al., 2011). Progressive PD also offers a proactive assessment of teacher PD programs where there is necessary analysis and reflection to ensure the learning needs of the teachers are being met (Díaz-Maggioli, 2004).

Ideally, PD programs should be intentional and specific to the individual needs of a teacher, ongoing through the duration of a teacher's career, and systematic (Díaz-Maggioli, 2004; Hunzicker, 2011). It should also be a continuous process to reflect the dynamic cultural nature of the school and classroom (Eun, 2011). "The concept of professional development is moving away from the practice of attending courses and training days to the concept of lifelong learning and continuing learning today" (Bayrakci, 2009, p. 12). The difference here is that the emphasis should be on teacher learning that is a part of the daily school routine as opposed to the focus on delivering particular content in another location (Hunzicker, 2011; Poekert, 2011). In this regard, progressive PD would bring about teacher learning within the workplace of teachers and would achieve more of a balance between formal and informal learning opportunities.

Formal Learning

In order to reveal how learning is enacted within the professional communities of teachers within this study, the literature on workplace learning has been linked to teacher PD.

This section explores the formal and informal learning processes that were found within the traditional and progressive PD approaches.

The current context of teacher PD is primarily based on formal learning opportunities with a *one-shot*, 'get-it-while-it's-hot' focus. Formal learning is described as being policy-driven, top-down, and a passive learning opportunity for teachers (Jones & Dexter, 2014; Lom & Sullenger, 2011). It is delivered to many teachers at one time using a lecture format. Examples include, but are not limited to: one-day workshops, Teacher's Convention, specialist council conferences, PD days where a speaker is brought in, and Smart board training sessions. Most often teachers have to go outside of the school to access their PD and learn in isolation. This is evident as they have very little time to talk with other teachers or share their knowledge when they return to the school (Musanti & Pence, 2010). There are also schools that do not allow teachers the opportunity to have input into their own PD because the administrators decide on the PD activities. The amount of PD made available to teachers is determined by policy, in regards to the number of PD days provided by the school board, time during the school day or calendar, and funding by the school or government (Hodkinson & Hodkinson, 2005; Hoekstra et al., 2009). Formal learning opportunities are found throughout the traditional PD practice.

Informal Learning

As defined previously, informal learning lacks the boundaries found in formal learning and occurs within the work community, work processes, and activities. Teacher informal learning allows teachers the opportunity to "interpret new knowledge and experience through their existing beliefs and modify and reinterpret new ideas on the basis of what they already know and believe" (Feiman-Nemser, 2008, p. 700). Hoekstra et al. (2009) explained that through their active participation within an informal learning activity, teachers are able to change their

behaviour and/or cognition. It is in the reinterpretation process that a change will occur and this change will further the knowledge a teacher cultivates. Informal learning opportunities for teachers "occur regularly in the context of daily practices, typically in the form of focused episodes dealing with real problems [whereby] support from peers and more accomplished colleagues is common" (Schlager & Fusco, 2003, p. 212). The social and cultural context of the teachers' workplace influences this informal learning process (Feiman-Nemser, 2008), with the trust between colleagues being a part of this context. Short (2014) asserted, "trust is crucial in a learning situation, and ideas and information are unlikely to be shared without it" (p. 1016).

Marsick and Watkins (2001) further emphasized that informal learning is characterized as being integrated in daily routines, triggered by an internal or external jolt, not highly conscious, haphazard and influenced by chance, an inductive process of reflection and action, and linked to the learning of others. For teachers, their jolts would either come from within their classroom or from an initiative implemented by their school. As they are reacting to the jolt, teachers would interact with each other to examine possible solutions and go through a continual process of reflection and action that was both individual and as part of their community. For teachers, this learning process "is an integral and often unconscious part of their lives within their working communities" and is prevalent within many of the different informal learning workplace activities (Fuller, Hodkinson, Hodkinson, & Unwin, 2005, p. 60).

Informal learning workplace activities for teachers encompass a variety of different methods. It can include learning by experimenting, considering one's own teaching practice, getting ideas from others, or through teaching experience (Hoekstra et al., 2009). It can also be where teachers participate in joint work or activities such as peer observations of practice or sharing and reflecting on others' practice and experiences, analyzing student work and student

data, learning from a professional community beyond the school, school-based coaching, and mentoring and coaching during induction (Schei & Nerbo, 2015; Wei, Darling-Hammond, Andree, Richardson, & Orphanos, 2009).

Informal learning activities can also consist of a practice where "teachers observe other teachers, are observed by others, and participate in informed and telling debate on the quality and effectiveness of their instruction" (Fullan, 2007, p. 36). Most of the activities associated with informal learning are dynamic and collaborative in nature in which teachers are working with other teachers to construct knowledge. This is invaluable to teachers as it is a natural process that results from working in a social environment. Collaboration and other informal activities have been the most beneficial, not only because they allow for genuine relationships to develop with colleagues, but also because they allow teachers the opportunity to learn from each other (Jones & Dexter, 2014; Musanti & Pence, 2010; Wei et al., 2009). An example would be when teachers are working together to create a common unit exam. These teachers not only have an opportunity to further develop their personal relationships but they also have the opportunity to scrutinize their form of assessment and the interplay their exam will have with the curriculum and their course content. Informal learning activities are prevalent within the progressive PD practice.

Empirical studies. Some of the studies completed on teacher informal learning have focused on communities of practice in K-12 education. Hodkinson and Hodkinson (2004) completed a case study of secondary school teachers to examine two different ways of conceptualizing communities of practice as described by Lave and Wenger (1991). The authors explored the tensions between the large-scale version of a community of practice, such as occupational organization, structure and purpose, and the small-scale version of a community of practice that has a particular, localized pattern of social interaction. Schlager and Fusco (2003)

examined the reciprocal relationship teacher professional development and instructional improvement interventions have with communities of practice. They used the activity theory to conceptualize and analyze the community of practice of education professionals designing an online sociotechnical infrastructure, both from an individual and a larger group context. Fuller et al. (2005) explored the strengths and weaknesses of Lave and Wenger's (1991) legitimate peripheral participation in communities of practice. They provided an understanding as to how communities of practice illuminate the nature and process of learning at work. These studies offered further understandings as to how communities of practices are understood but do not investigate how teachers are actually learning within the community of practice.

Other studies have combined literature from workplace learning and teacher development to explore how teachers are learning within their workplace and the influences that are affecting their learning. Hodkinson and Hodkinson (2005) reported on a research project that had spanned three years in which learning in a variety of workplaces was investigated. They provided keen insight into the ways teachers are learning at work and more importantly, identified that teachers are learning within a restrictive environment and provided suggestions on how to make this environment more expansive to better support teacher informal learning. Williams (2003) completed a case study of new teachers in which she examined their informal learning. Using a conceptual framework of non-formal learning and early professional learning, Williams concluded that the informal learning of new teachers is reactive, implicit and horizontal, and is most likely to occur in a collaborative context. Hodkinson and Hodkinson (2005) also identified collaborative learning as one of the ways teachers learn at work, "a significant proportion of teacher learning occurs through collaborative interactions with others" (p. 116). This research was an important step in discovering the ways teachers are learning in their workplace however,

my research extended from their work and delved into how teachers are learning from each other within their knowledge culture and provided a further characterization on teachers' learning environments.

Tarc (2007) completed a 10-year empirical study on Canadian teachers' work and learning in which he methodically examined the many different discourses, uses, and challenges of informal learning. Tarc offered a variety of ways that informal learning is used and the intention and effects these uses have and links this information with the results he gleaned from his mixed method approach, where he used yearly surveys and focus groups interviews. Despite the strength of his literature review, the results of the study only provided a superficial overview of informal learning. The study was limited in its ability to provide an in-depth look at the more tacit levels of learning. For example, Tarc (2007) explained, "although the research clearly indicated that teachers learn from and value collaboration with their colleagues, less clear is what or how well teachers were learning" (p. 81). My research moved deeper into the analysis of teacher informal learning and provided more in-depth understandings as to how teachers experienced informal learning, how this impacted their teaching practice, and the mechanisms and tools the teachers used to co-construct knowledge with their colleagues.

Jurasaite-Harbison (2009) examined the informal contexts of teachers' workplace learning to gain a better understanding of how teachers learn while on-the-job and the ways these environments allowed for teachers to be career-long learners. The author used discourse analysis and interactional ethnography to investigate the learning environments of three contrasting schools in the United States and Lithuania. She found that all of the schools shared common elements of learning organizations but that they differed in leadership, professional relationships, and teachers' individual stances. These differences defined the richness and diversity of the

informal learning contexts. This paper provided information on the different aspects of a school culture that can either enhance or discourage teacher informal learning. Jurasaite-Harbison identified the importance of administration constructing a school culture that supported informal learning by providing stimulating social contexts but she did not identify what sorts of objects or practices would be needed in this sociocultural context to support learning. My research addressed this by focusing my analysis on the knowledge culture of the school where I identified the objects and practices that were being used or produced by teachers as they learned from each other.

In their study of teacher informal workplace learning, Hoekstra et al. (2009) provided insight into a teachers' perception of her school as a learning environment and demonstrated how these perspectives were related to informal learning activities. The authors aimed to generate needed evidence to transform the working conditions of a school, which could then be used to improve the ongoing development of teachers. They sampled 32 teachers and then narrowed their focus to two teachers, using a mixed methods design to position the two teachers with their peers. It was found that the perception that teachers have of their workplace conditions play a significant role in their learning process. The interpretation of these conditions can influence and shape their informal learning in many different ways. Hoekstra et al. (2009) concluded, "the relationship between collaboration and learning is not self-evident" (p. 293) and that future qualitative studies should focus on the interplay between workplace learning activities and outcomes and patterns of interactions between teachers and their colleagues. My research addressed this identified need, as I investigated the social interactions of teachers within their knowledge culture and the interplay this has with their learning or knowledge they are producing.

Lom and Sullenger (2011) explored teacher informal learning during a collaborative project that had teachers, members of community-based science organizations, graduate students, and post-secondary educators working together to create and implement an afterschool science program. Lom and Sullenger used the model of cooperative inquiry and personal experience methods to study the collaborative process and comprehend what teachers count as PD and the affect this collaborative process had on their classroom practices. This study had a strong focus on teacher PD in terms of how teachers conceptualized their PD and how teachers volunteered to participate in this project during their own time and on their own initiative. Although this study examined informal spaces in collaborations, it differed from my research. My research focused more on teacher learning than PD, and examined how teachers are learning during this collaborative process.

Research on teacher informal learning has provided information on the various ways informal learning is being enacted within the workplaces of teachers and the role of the context or working conditions in informal learning. However, despite this completed research there is still much to be understood about teacher informal learning particularly in regards to how teachers are actually learning within their community of practice, their learning environments, what and how teachers are learning from each other during their collaborative processes, and the influence social interactions has on their learning and the knowledge they are producing. My study will address these gaps.

Collaboration and Professional Communities

Throughout the literature on teacher PD and learning, the term collaboration is used quite often to describe the activity teachers are carrying out as they work together within their professional community. There are a lot of assumptions surrounding teacher collaboration and

this study will provide clarification on the impact teacher collaboration has on teaching practice and the informal learning processes that are enacted within the teachers' collaborative practices. In this next section, I provide a description of collaboration and how it has been characterized in the literature on professional communities. I then explore research on professional learning communities (PLCs) and communities of practice, which are the professional communities most relevant to this study.

Collaboration

Collaboration is the primary activity that is carried out by members in a teacher community. Collaborative practices, as defined by Musanti and Pence (2010), are "central to professional development because they further opportunities for teachers to establish networks of relationships through which they may reflectively share their practice, revisit beliefs on teaching and learning, and co-construct knowledge" (p. 74). Collaboration provides a situated approach to teacher learning because it is grounded in a teachers' own practice (Wei et al., 2009). It exemplifies the premise of informal learning principles.

Collaboration involves teachers volunteering to work together to achieve a common goal and co-constructing relationships, meanings and knowledge, that are based on mutual respect for each others needs, strengths, and differences (Ganley, Quintanar, & Loop, 2007; Jones & Dexter, 2014; Musanti & Pence, 2010; Piercey, 2010). When teachers are collaborating, there is a shared sense of responsibility for participation, decision-making, and outcomes (Piercey, 2010). Rosenholtz (1991) argued collaboration brings "new ideas, fresh ways of looking at things, and a stock of collective knowledge that is more fruitful than any one person's working alone" (p. 41). Collaboration between and amongst teachers provides opportunities for teachers to grow in their pedagogical practices and for them to learn in new ways that may not happen if they were to

work in isolation or individually. Levine (2010) summarized the value of collaboration eloquently:

> When we work with others, it seems that we are often capable of participating in practices and having thoughts that would be impossible for us if we were on our own. There are multiple ways to understand what we learn and how we learn when we work with others. (p. 127)

Lavié (2006) added to these characterizations of collaboration in his description of the five discourses that are ubiquitous in the literature on teacher collaboration: (1) cultural discourses describe teacher collaboration as being embedded in the cultural forms of the workplace in terms of their professional and personal relationships; (2) community discourses embed teacher collaboration in a vision of schools working together as communities; (3) effectiveness and improvement discourses view teacher collaboration as a product of cultural management that is led by the school's principal and as a strategy to increase student academic achievement; (4) restructuring discourses depict teacher collaboration as a practice that is enacted within a learning organization and is related to the community's shared norms and values; and (5) critical discourses describe teacher collaboration as a collective practice that integrates democratic practices, community participation, and shared reflection on teaching.

The literature is quite diverse in the use of the term collaboration however, these discourses will often converge on the purpose of teacher collaboration which is to stimulate "greater improvements in teaching and learning, [facilitate] implementing effective change, and [provide] possibilities for new models of professional development based on shared reflection in the workplace" (Lavié, 2006, p. 774). Collaboration is the main activity carried out within professional communities and is seen to be one of the key factors in improving schools. As such,

it is imperative to gain a better understanding of the informal learning processes that are enacted within the teachers' collaborative practices.

Professional Communities

Quite commonly in workplace learning, collaboration is referred to as occurring in a community. There are different types of communities that are currently used in education as informal activities. These are Inquiry Community, Professional Learning Community, Teacher Professional Community, Community of Learners, and a Community of Practice (Levine, 2010). Each of these communities provides a context for teachers to come together in to participate in professional conversations and for ongoing collaboration to produce teacher learning (Levine, 2010; Levine & Marcus, 2007). However, they differ in what teachers create together, the mechanisms of learning, and in their limitations (Levine, 2010). Schools within Alberta have been encouraged to incorporate PLCs as part of their organizational learning through the AISI policy. A PLC is a variation of a community of practice in which a group of teachers within a school work collaboratively to collectively improve pedagogy and student achievement (Levine, 2010). The PLC is characterized in terms of how shared norms, beliefs, and routines affect teachers' work with colleagues and students. There is a prescriptive methodology for schools to follow in which they establish a community that has a commitment to continuous improvement, a collaborative culture, collective inquiry, and distributed leadership, but the mechanisms for learning within the PLC are unclear (Jones & Dexter, 2014; Levine, 2010; Westheimer, 2008). My study provided clarity on these learning mechanisms in terms of how teachers were learning informally within their knowledge culture.

Community of practice. A significant contribution to the research on workplace communities, and an important work of studies that my research related to, was Jean Lave and

Etienne Wenger's community of practice (1991; Wenger, 1998). A community of practice is characterized as employees, from all levels of career development, learning together through their social participation. It is "groups of people informally bound together by shared experience and passion for a joint enterprise" (Wenger & Snyder, 2000, p. 139). Learning is brought about through a sense of belonging to the community, by developing their professional identity, constructing meaning out of experiences, and by carrying out work processes (Wenger, 1998). Employees participate in the community of practice, partaking in conversations that examine practices and generate ideas to solve problems. When new employees enter the community of practice, Lave and Wenger (1991) noted that these novice employees experience legitimate peripheral participation. They begin learning at the periphery of the community and as they become more competent and seasoned in their work, they move to full participation. In this regard, a novice employee learns through their gradual increased participation within the community. Participating in a community of practice reflects the situated theory of learning where "knowing is intertwined with doing" within a sociocultural context (Merriam et al., 2007, p. 160). Language is "everything that has meaning" and for employees, this constitutes the main communication form in which they share and construct their knowledge within their culture (Biesta & Burbules, 2003, p. 29).

As Wenger's studies progressed on social learning processes, knowledge management, and organizational learning, and in response to critique of their initial conceptualizations of a community of practice, Wenger furthered their conceptualization to include a specific focus on knowledge and knowledge management, an acknowledgement of artifacts or tools within a community, and of the expert, abstract knowledge (Wenger, 2004; Wenger, 2006). Three characteristics of a community of practice were detailed in this work: domain (the community

has an identity, there are shared interests, competence, and areas of knowledge), community (a group of people who carry out joint activities and discussions, they share information and help each other), and practice (employees develop a shared repertoire of resources and body of knowledge). Wenger has provided more focus on knowledge management in terms of how it is created and documented by and between employees, and on the structuring of a community of practice and how to establish a community of practice as a form of knowledge management.

In response to schools being encouraged to foster organizational learning, communities of practice have been formed for teachers. In their community of practice, teachers partake in professional conversations where they describe and explain their teaching practices and philosophies, allowing a teacher to gain multiple perspectives on instruction possibilities (Jenlink & Jenlink, 2008; Levine & Marcus, 2007). Adger, Hoyle, and Dickinson (2004) explained that a community of practice provides teachers with the opportunity to learn collectively as a natural outcome of the social interaction that happens within the community. “Knowledge, both explicit and implicit, is negotiated in this practice, enabling meaning to be constructed through what the community actually does” (Jenlink & Jenlink, 2008, p. 314). Adger et al. (2004) further stated, it “emphasizes the negotiation of meaning by members of a community” (p. 871). Through active participation in professional conversations, teachers are able to dissect their instructional and pedagogical beliefs.

Communities of practice are also characterized by providing an opportunity for teachers to “share a domain of interest, the pursuit of the interest, engagement as practitioners of that interest, and a repertoire of gestures, words, actions, and behaviours that reflect their negotiated and shared meanings” (Sirna, Tinning, & Rossi, 2010, p. 73). This collaborative learning involves trust between colleagues, as the teachers are vulnerable (Short, 2014; Van Maele & Van

Houtte, 2011; Zand, 1997) in the sense that they are exposing their practice to others, taking ownership and responsibility in the shared vision of the community. “They recognize that cooperative endeavors are essential for individual fulfillment” (Hytten, 2009, p. 403), as more learning happens within a group than as isolated individuals.

By participating in a community of practice, teachers are socially constructing ways of thinking, acting, and being (Sirna, et al., 2010). While learning and developing shared practices, teachers are influenced by the social and cultural norms of their workplace and this provides a means by which the historic, chief instructional practices and the norms of teaching can be passed on to teachers over time. As a result, communities of practice generate opportunities for new knowledge to be created and carried forward (Sirna et al., 2010). Communities of practice offer a collaborative context for teachers where they can socially construct knowledge that is relevant and pertinent to their profession. To conclude then, the teachers’ professional community in this study will be an ideal setting to examine teacher informal learning and to gain better understandings of the impact collaboration has on teaching practice and the interdependence between individual and social processes in teacher workplace learning.

Sociocultural Theory and the Social Construction of Knowledge

The theories most relevant to this study are the sociocultural theory and the social construction of knowledge. In the examination of how teachers experience informal learning, I will gain further insight into how the mechanisms and tools of a teachers’ workplace facilitate the co-construction of knowledge between teachers and the impact of infrastructure, professional relationships, and practices on teacher learning. These theories provide the basis for explaining how teachers produce knowledge together and the impact the culture of their workplace has on

their learning and teaching practices. The next section provides an overview of the two theories and their relevance to examining teacher learning within a professional community.

Sociocultural Theory

The sociocultural theory is centered around the work of Lev Vygotsky and is based on the premise that a better understanding of an individual can be achieved by examining the relationship that exists between themselves and their environment or sociocultural-historical context (DeFillippi & Ornstein, 2005). Higher mental functions are developed and learned through a dialectical approach in which a person interacts with the cultural tools in their daily life (Koballa, Kittleson, Bradbury, & Dias, 2010; Levykh, 2008). The cultural tools are a critical component in the reconstruction of human cognition. They include various forms of data, experience, and expressions of language and "are used to exchange, signify, and transform ideas" (Koballa et al., 2010, p. 1074). Through their interaction with student achievement data, their personal teaching experiences, the teaching experiences of others, and language, teachers are able to construct and reconstruct meaning and knowledge within their community of practice. Teachers require a collaborative setting within their workplace so that professional conversations can occur and that they are comfortable to challenge, critique, and alter their practices (Levine & Marcus, 2007). For, Levykh (2008) contended, that this is "one of the main themes in Vygotsky's scientific inquiry… what was once social (occurring through interactions with people) becomes individual" (p. 86).

When teachers participate in a community of practice, they have the opportunity to learn with their colleagues in the unique cultural context of their school. This provides a social environment in which "learning [is] situated in everyday social contexts and [is] the process of changing modes of participation in a community, from peripheral to central membership and on

to expert status" (Koballa et al., 2010, p. 1075). The social environment allows for a diversity of voices to be heard from within the community and for teachers to participate in various roles, either as a neophyte or a master. Levine and Marcus (2007) further explained that teachers progress in their learning beginning with a reliance on their peers to "master new skills, practices, or ways of thinking" (p. 123) but eventually transition to a state where they have internalized the knowledge and are able to function independently in the skill or practice. Once the information has been internalized, a teacher will in turn be able to externalize this knowledge or skill, becoming a master within the community of practice. "In this way, they mediate their own cultural development" (Levykh, 2008, p. 100). This developmental process is a dynamic, complex reconstruction, crisscrossing between the "ever-changing relations between the new and the old (or central and peripheral) mental systems" (Levykh, 2008, p. 86).

Within a community of practice new and veteran teachers learn collaboratively together within their social context. They are able to construct knowledge through their professional conversations, with each teacher bringing valuable information to this context. This collaborative context provides an ideal setting in which my research on teacher informal learning was conducted.

Social Construction of Knowledge

Social constructionism is one of the many different examples of the constructivist learning theory and extends from the work of Immanuel Kant, Jean Piaget, and Lev Vygotsky. McLaren (2009) defined it as:

> The product of agreement or consent between individuals who live out particular social relations (e.g., of class, race, and gender) and who live in particular junctions in time… [where knowledge] is constructed symbolically by the mind through social interaction

> with others and is heavily dependant on culture, context, custom, and historical specificity. (p. 63)

Teachers are able to learn and develop within their community of practice as they seek to understand what is happening around them and through the relationships with others. "New knowledge is constructed interactively and internalized by individuals" (Adger et al., 2004, p. 871).

Social and cultural activities are the roots for this theory, where knowledge and the mind are seen as existing primarily outside of the individual (Scott & Palincsar, 2009). As teachers are working together in their community of practice, they use their cultural tools or a combination of them to construct knowledge. Each individual will interpret and reconstruct the shared information in her own unique way, since as Biesta and Burbules (2003) stated, "the only possible construction is a *re*construction" [emphasis in original] (p. 51). There is the expectation, from a constructivist perspective, that within the community of practice teachers will conflict and clash as their social and cultural ideals and beliefs are exposed and challenged (Scott & Palincsar, 2009). Therefore, "knowledge is partial, provisional, and imperfect" (Scott & Palincsar, 2009, p. 31).

The collaborative context of the community of practice allows teachers to go through critical discourse as their ideals and beliefs are conflicting and clashing. This is essential for social constructionism as it "determine[s] what gets to remain in the public pool of information that counts as knowledge" (Longino, 2002, p. 129). These critical discourses bring consensus over information that will be accepted and mesh with the community's cognitive goals and standards (Longino, 2002). "Effective critical interactions transform the subjective into the

objective, not by canonizing one subjectivity over others, but by assuring that what is ratified as knowledge has survived criticism from multiple points of view" (Longino, 2002, p. 129).

Workplaces are vibrant contexts in which employees use artifacts such as policy documents and technology to guide and assist their work and develop relationships with other employees by working together. Workplaces tend to have a culture or a particular way of doing things, where employees settle into a routine that is comfortable for themselves and others. In this regard, Billet (2003) explained, "workplaces can be defined as arenas of activity in which socioculturally determined practice occurs" (p. 51). Consensus of knowledge in the work community is achieved through a collaborative dialectic process whereby individuals either mutually agree or resolve opposing views that are in conflict (Plaskoff, 2005). Learning for employees in this socially constructivist view is an active process where life experiences play a key role as a stimulus for learning, as do the interactions with other learners (Merriam et al., 2007).

Teachers are immersed and learning within the school culture. "[P]rofessional knowledge develops not only in the mind of an individual but is inherent to the contexts within which the individual interacts – cultural, physical, social, historical, and personal" (Jurasaite-Harbison, 2009, p. 300). Green et al. (2010) explained, "sociocultural perspectives… acknowledge the contexts of the learner and the ways in which the learner interacts with and learns from the people and artefacts in the community" (p. 261). Dewey (1938a) described this as individuals living through a series of situations in the world where there is interaction between the individual, objects, and other persons.

> An experience is always what it is because of a transaction taking place between an individual and what, at the time, constitutes his environment, whether the latter consists

> of persons…, the subject being talked about…, the materials of an experiment he is performing…, [or his] personal needs, desires, purposes, and capacities to create the experience which is had. (p. 116)

For teachers, their school context involves the students in their classroom, the colleagues they work with in their PLC and throughout the building, and the objects used in their work such as computers, textbooks, and software programs.

Informal learning provides teachers with the opportunity to be engaged in learning experiences within their departments, school, or school district. As a teacher progresses through a series of experiences in her professional life, she engages in various situations and accumulates knowledge based upon her previous experiences. The previous situation "becomes an instrument of understanding and dealing effectively with the situations which follow" (Dewey, 1938a, p. 116). As such, each teacher brings her own beliefs and insights, understandings, values, previous experiences, and unique contributions to the teacher community (Green et al., 2010). Musanti and Pence (2010) further explained that teachers are affected by their experiences as learners, their self-efficacy, and their knowledge about themselves. These would affect the actions of teachers and the decisions they make, and would ultimately be brought to the teacher community. The social interactions that occur within this teacher community are fundamental to the effective learning processes as they promote "meaningful teaching and learning through regular engagement of education professionals in processes to examine and refine instructional practices to improve teaching and learning processes for children" (Green et al., 2010, p. 261).

The knowledge that is being exchanged and formed within their community of practice happens as a result of the relationships and interactions that are occurring between the teachers (DeFillippi & Ornstein, 2005). "Knowledge is constructed as something that is outside oneself

and resides in the more expert other and expertise is constructed as perfection in myriads of teacher standards" (Musanti & Pence, 2010, p. 82). The professional conversations that teachers engage in are critical to this construction process, as thoughts, ideas, and critiques have to be verbalized. DeFillippi and Ornstein (2005) contended that learning in this context "involves socially mediated cognitive processes of interpretation and sense making" (p. 27) and "encompasses both the epistemology and the ontology of learning" (Elkjaer, 2005, p. 39). Teachers are able to learn more about themselves and develop professionally through active participation in the community of practice. As Lave and Wenger (1991) stated:

> Participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions for legitimacy define possibilities for learning. (p. 98)

Together, this sense of belonging and social context, influence how teachers construct knowledge.

The community of practice offers a context where teachers are able to challenge the beliefs of their teaching practices that they hold or that have been sustained in the school over time. According to Hytten (2009), this space presents the opportunity for teachers to be able to consider multiple perspectives and for the possibility of being able to generate more ideas collectively then individually. Dewey claimed, "the process of knowing is open-ended; truths arise from practice, and they must be constantly tested to be discarded, fixed, or improved in ever-new situations at different times and in different locations" (as cited in Hytten, 2009, p. 405). For teachers, this means that the knowledge construction process is dynamic and ongoing. The ideas for instructional practices, for example, must be carried out by all the teachers in various classrooms and subjects, re-evaluated, and changed if necessary. Considerable time is

needed to allow for the ideas to percolate and then ferment, as the ideas are trialed and for critical discourse to transpire. “Knowledge cannot be had in an instant” or in short time increments (Boyles, 2006, p. 59), as the pathway to knowledge requires a “*combination* of reflection and action” [emphasis in original] (Biesta & Burbules, 2003, p. 46).

The knowledge that is being constructed by teachers in a collaborative effort is the knowledge for, in, and of their practice (Darling-Hammond & Bransford, 2005). Knowledge for is usually developed during the time spent at university in a teacher education program. Teachers develop both their subject knowledge, found in curricular documents and formally taught to students, and their education knowledge, theoretical and practical knowledge of their profession (Eraut, 1995). Knowledge in is of a more practical nature that is generated from experience (Darling-Hammond & Bransford, 2005). Eraut (1995) described this as composing of both the experiences of teaching in the classroom and from being a member of society. Knowledge of is where the teacher community becomes imperative, as “it emphasizes the role of the teacher in constructing knowledge and learning, and growing through that process” (Darling-Hammond & Bransford, 2005, p. 383). The teacher is applying both theoretical and pedagogical knowledge as she carries out her daily work and she is also interacting with the other teachers in her community to debate, reflect, and enact this knowledge (Eraut, 1995). Dewey (1904) explained that a teacher’s professional practice is informed and developed through a combination of reflecting upon their teaching experience and of the theory gained from university and professional development activities. As teachers within the community construct knowledge, they are cumulatively bringing together these knowledge bases of theory and reflective experience, allowing them to make professional judgments about their educational responsibilities, such as assessment and pedagogical practices.

Hodkinson and Hodkinson (2005) supported the above approaches to knowledge construction as they stated, "a combination of construction and participation provides a way of understanding learning that best fits the current research evidence, and is most likely to maximize possibilities for improving teacher learning in the future" (p. 111). Teachers' learning environments should be collaborative, have colleagues supporting each other in their learning, opportunities to participate in more than one working group, and to use a wide range of learning opportunities (Hodkinson & Hodkinson, 2005).

Collaborative interactions within a community of practice afford teachers the opportunity of learning within the sociocultural context of their workplace. They are able to produce and gain knowledge through interactions with their cultural tools, their colleagues, and the established professional practices of their knowledge culture. Teachers have opportunities to critically reflect on and make any necessary changes to their teaching practices and help propel the collective knowledge of the community of practice forward. As such, an examination of the teacher informal learning processes within a professional community will allow me the opportunity to gain and develop better understandings of how teachers co-construct knowledge and how infrastructure, professional relationships and practices impact their learning.

Knowledge Cultures

In the last part of the literature review, I explain knowledge cultures, which are the premise for my conceptual framework. For this study, I conceptualized the professional learning of teachers as occurring within a knowledge culture as opposed to a community of practice because of the emphasis knowledge cultures has on the embedded and enacted knowledge processes and practices within a workplace. Throughout the next section, I provide a description of knowledge cultures and examine various empirical studies that have investigated

professionally based knowledge cultures. I conclude the literature review with a detailed explanation of my conceptual framework.

Karin Knorr Cetina is a sociologist and the prime contributor to the strand of research on knowledge and epistemic cultures. In 1999, she completed a comparative study between two different epistemic cultures; one in a high-energy physics lab and the other in a molecular biology lab. From this study, she deduced that each culture had an unique way of constructing and warranting knowledge. It was from this study and previous work on studying how scientists generate knowledge, that she theorized knowledge and epistemic cultures and spurred interest in this promising body of work on examining how professionals learn within their workplace.

Since the early 1990s, organizations have been striving to establish a learning organization within their workplace. As a result, the value of knowledge within the workplace has greatly increased and there has been a shift towards global knowledge societies, where "knowledge has become a productive force that increasingly replaces capital, labour and natural resources as central value- and wealth-creating factors" (Knorr Cetina, 2007, p. 361). This is eminent in Canada, where there has been a dramatic shift over the past generation from "a demand for physical labour to a growing need for knowledge workers" (Canadian Council of Learning, 2011, p. 25). These global knowledge societies lead to epistementalities or "collective beliefs about the production and distribution of knowledge that operate across institutional boundaries and constitute organizational arrangements of roles and agencies" (Nerland, 2010, p. 184). The way employees within the workplace envision knowledge, in terms of its character, outreach, and opportunities, is a part of their social life. They both influence the knowledge culture of their workplace and are influenced by it in terms of how they learn to see the world (Jensen, Nerland, & Enqvist-Jensen, 2015; Nerland, 2008). Thus, each profession has its own

knowledge culture that is unique in terms of the practices or ways that they manage and engage with knowledge and influence their work-based learning (Nerland, 2008, 2010). Knorr Cetina (2006) asserted these unique ways of professional work incorporate inquiry practices of validating, documenting, and legitimizing knowledge, which has traditionally been associated with scientific work.

These inquiry practices are social and collective processes; Validation is the process of confirming, supporting or corroborating, documentation is the process of creating a representation of thoughts, and legitimization is individuals in a local (and broader) community collectively constructing objects of knowledge. Objects of knowledge or knowledge objects are more than just definitive things; they are also processes and projections that are characteristically open, question-generating, and complex (Knorr Cetina, 2006). They have the capacity to propel further investigation and as employees continually interact with both the definitive and figurative objects in their work, they utilize their inquiry practices to validate and co-construct knowledge (Nerland & Jensen, 2010, 2014). “Through this construal process, what is becomes what is right” (Johnson, Dowd, & Ridgeway, 2006, p. 57). As such, employees within these other professions will have to continually keep learning and reinventing practices of their own to acquire knowledge (Knorr Cetina, 2001).

Professional communities operating as a community of practice have unique ways of producing knowledge based on the culture of their workplace, methods of production, artifacts and tools, and traditions that they use within their workplace. Nerland (2008, 2012) argued that there are four knowledge domains that characterize professional communities: (1) each community differs in the extent to which their collective ways of knowing rest upon science, personal experience, reflexivity, or codification; (2) each community differs in how they

accumulate knowledge, either in a cumulative or linear fashion and either collaboratively or individually; (3) each community differs in how they distribute knowledge, in terms of relying on technology or written language; and (4) each community differs in how they access knowledge and how they apply knowledge advancements.

These domains form the epistemic culture of a workplace, which as defined by Knorr-Cetina (2007) are "sets of practices, arrangements and mechanisms bound together by necessity, affinity and historical coincidence which, in a given area of professional expertise, make up how we know what we know" (p. 363). The epistemic culture has distinct heuristic practices and knowledge relations that include such things as activities, instruments, and ways of envisioning knowledge (Nerland, Jensen, & Bekele, 2010). They are directly involved in the advancement and generation of ideas and are central to a collaborative process (Damsa et al., 2010). Therefore, the normative conditions for professional learning include a "mediated relation between professional education, access to knowledge objects, creative engagement with practice and organized dissemination channels" (Guile, 2009, p. 769).

Empirical Studies

The majority of research on knowledge cultures and the epistementalities of professionals have been completed in Europe in recent years. One of the most prevalent conceptual frameworks to highlight the interactions between epistemic strategies and professional knowledge cultures is Knorr Cetina (2007). In her paper, Knorr Cetina explained in great detail the concepts of knowledge and epistemic cultures and demonstrated their significance in the global society. She conceptualized epistemic cultures as the machinery for constructing knowledge and knowledge cultures as having a more general focus where knowledge practices are embedded and enacted. Knorr Cetina concluded with emphasizing the need to research

knowledge and epistemic cultures in particular professional contexts and the various epistementalities professions have since we are currently immersed in a knowledge society.

Guile (2009) provided a conceptual piece of research on the meaning of practice from a traditional standpoint in philosophy and sociology theory, and demonstrated that the current accumulation of qualifications to enter into the workforce in the UK is ineffective in helping new workers develop their vocational practice or a mix of knowledge, skill, and judgment. Pulling on research from the sociocultural theory, science studies, and activity theory, Guile provided a new conception of vocational practice and its various implications. He argued that epistemic objects fill a gap in literature surrounding the traditional meaning of practice and that knowledge is a more effective method to bring about change and development since it offers a "generative, embodied, relational and situated character of practice" (Guile, 2009, p. 773). In this manner, vocational practice for new workers is more multi-faceted and developed as opposed to simply having a new worker accumulate qualifications.

Damsa et al. (2010) completed a qualitative study to examine the construction of shared epistemic agency of university students collaborating on instructional design activities. Epistemic agency implies activities involved in knowledge and knowing and is a part of knowledge-building communities. Drawing upon theoretical perspectives from learning as knowledge creation, human agency and epistemic agency, and empirical data from two case studies, Damsa et al. determined that shared epistemic agency is constructed as a continuum in which groups can situate themselves at certain moments during their development and collaborative work. In other words, when groups are creating knowledge objects, both epistemic and regulative dimensions are at play, where individuals in the group decide on their collaborative activities to create and develop shared knowledge objects. At the same time, they

must decide how they will carry out the collaborative activities in terms of the processes they will use or a procedure. This will look different for each knowledge-building community.

Damsa et al. (2010) suggested that further research in this area should examine shared epistemic agency from the perspective of the interdependence between the individual and social processes during knowledge creation. This tied directly into the focus of my research that examined how teachers are learning from each other. I investigated how a teacher produced knowledge within her knowledge culture from a sociocultural perspective, where I examined the dialectical approach used by a teacher as she interacted socially with other colleagues and with the cultural tools of her workplace.

The Norwegian Research Council has funded a considerable number of research projects centered on professional learning in Norway. An example is the *Professional Learning in a Changing Society* (2004-2008) project that was led by Karen Jensen, in collaboration with Leif Christian Lahn and Monika Nerland, all from the University of Oslo. This research project was a comparative study of the early career learning among various professions that included nursing, teaching, accounting, and computer engineers. In general, the project examined the relationships that professionals have with knowledge and the role knowledge plays in identity and lifelong learning. The researchers determined from their analysis that each profession engages in workplace learning differently, particularly in terms of when and how they access distributed knowledge found in texts, technologies, and other artifacts. The study proposed that further research is required to examine how knowledge is organized, made accessible, and enacted in professional work (Jensen, 2007).

From this study, there have been various publications that have arisen. Nerland (2008) for example, drew on data from the project to analyze the knowledge culture of computer engineers

in terms of their knowledge domain, interrelated knowledge practices, and their engagement with knowledge objects. Nerland determined that computer engineer's experience both short-term and long-term learning loops in their knowledge culture; short-term learning involves using readily available knowledge objects for experimental practice and long-term learning involves continually keeping up with advancements in their field and caring for their long-term career interests. Nerland's study is of particular importance because of the information she determined in regards to the knowledge practices demonstrated within a particular knowledge culture of a profession and she provided further understanding to knowledge societies. She highlighted the importance of studying workplace learning activities in terms of how they are encouraged, directed, or even restricted.

Nerland et al. (2010) provided an extensive literature review on the approaches that have been used to study student learning in higher education and on the models and perspectives that are leading professional learning research. In this extensive literature review, the authors drew upon numerous research studies to identify gaps in knowledge and in particular, knowledge cultures in higher education and professional contexts. They encouraged future research to focus on analyzing a knowledge culture where objects and practices are embedded, as opposed to solely focusing on the objects or object-mediated practices. Nerland et al. also encouraged researchers to consider the diversity and discontinuity in the epistemic cultures in which different communities of practices are embedded in order to help understand change mechanisms in professional work and learning. They further added that the concept of epistemic cultures is hardly used in the studies of education and higher education and identified a need to research knowledge cultures and processes across and between workplaces.

Other research that has extended from this project includes Jensen, Nerland, and Enqvist-Jensen (2015) study on law students and the role that knowledge played as students entered into the profession; Nerland and Jensen (2014) reviewed theoretical and empirical contributions, including their empirical data from the project, to examine the relationship between knowledge cultures and professionals' learning in higher education and in their workplace; and Jensen, Lahn, and Nerland (2012) published an edited book that was based on the empirical studies that were carried out in the project and that explored Knorr Cetina's epistemic cultures in more detail.

Conceptual Framework

In order to study how teachers experience informal learning, I drew upon literature from two separate fields of research. I merged discourse on informal learning in workplaces from an adult education perspective with literature on teacher learning from a PD perspective. I also drew upon research completed on collaboration, professional communities, the sociocultural theory, and the social construction of knowledge. In light of this completed research, I identified gaps in the research that my study would address. These gaps included the need to better understand how teachers are actually learning within their community of practice, their learning environments, what and how teachers are learning from each other during their collaborative processes, and the influence social interactions have on their learning and the knowledge they are producing. The needs identified in the literature review necessitate an in-depth examination of teacher informal learning within a professional community.

The professional community within a teachers' workplace provides an ideal setting to gain better understandings of the impact collaboration has on teaching practice and the interdependence between individual and social processes in teacher workplace learning. It also provides the opportunity to complete research within the sociocultural context of the workplace

and provides opportunities to observe teachers co-constructing knowledge through interactions with their cultural tools, their colleagues, and the established professional practices of their community. As such, an examination of the teacher informal learning processes within a professional community allows me the opportunity to gain and develop better understandings of how teachers co-construct knowledge and how infrastructure, professional relationships, and practices impact their learning.

To elucidate how teachers experience informal learning, I chose the framework of a knowledge culture over a community of practice because a knowledge culture already exists within a workplace and as such has historical and cultural significance. A community of practice has evolved to be used more as a structural tool within a workplace and has stages of employee development and a time factor for managers to monitor. Within a community of practice there is more focus on knowledge as it is created and documented by and between employees, a focus on the structuring of a community of practice, and how to establish it as a form of knowledge management within an organization. A knowledge culture on the other hand, emphasizes the embedded and enacted knowledge processes and practices within a workplace and focuses more on knowledge in terms of how employees are validating, legitimizing, and documenting knowledge. It is more of a conceptual tool as there are no stages in employee development to be observed and no time factor to be monitored. As such, the knowledge culture provides an ideal conceptual framework for studying teacher informal learning.

Within a teacher's workplace, teachers are learning informally in many different ways such as learning by experimenting, reflecting on their teaching practices, peer observations, analyzing student data, and mentoring (Hoekstra et al., 2009; Wei et al., 2009). Teachers also share an epistimentality in terms of how they envision knowledge and in their unique way of

validating, documenting, and legitimizing this knowledge (Knorr Cetina, 2006; Nerland, 2010). Teachers learn informally and produce knowledge within the sociocultural context of their workplace through their own unique methods, artifacts, tools and traditions, and each teacher influences, and are influenced by, the social interactions and cultural tools of her knowledge culture (Nerland, 2008). As a result, the informal learning processes of teachers are embedded within the knowledge culture of their workplace. Some elements of this knowledge culture would be the collective way of knowing for the teachers, in terms of their degree of reliance upon science, personal experience, reflexivity, or codification; how they accumulate knowledge, either in a cumulative or linear fashion and either collaboratively or individually; how they distribute knowledge, in terms of relying on technology or written language; and how they access knowledge and how they apply knowledge advancements (Nerland, 2008, 2012).

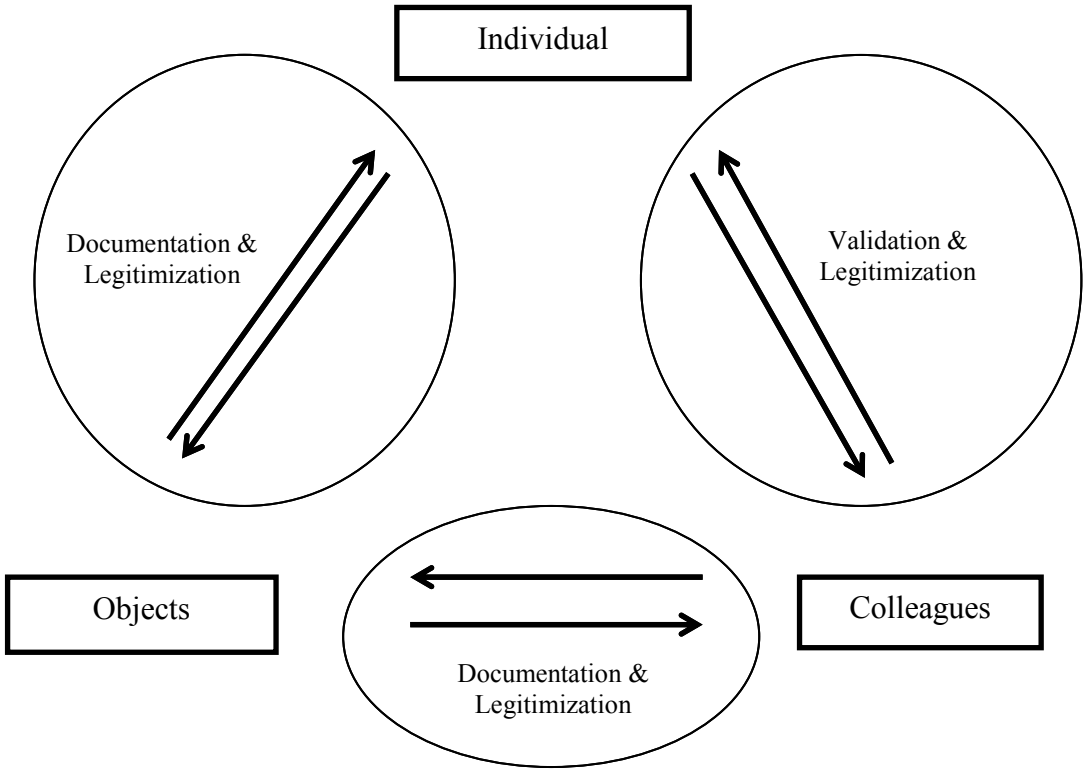

Figure 1. The dynamics of a knowledge culture. This figure illustrates the knowledge production process through informal learning activities within a knowledge culture.

The knowledge culture that teachers engage in is a way of being for them or a part of their daily work life. I have illustrated the dynamics of the knowledge culture in Figure 1. Throughout their workday, teachers are interacting with their colleagues and with the artifacts or objects of their workplace in a dynamic fashion in order to document, legitimize, or validate knowledge. There are also interactions between their colleagues and the objects to produce knowledge. The knowledge culture is in a constant state of flux, as the interactions that occur and the knowledge production processes are fluid and dynamic. The knowledge culture strives for an equilibrium or steady state of being, but the everyday activity of a school causes system disruptions. For example, after reflecting on a lesson and discussing what happened with a colleague, a teacher may make changes in their next lesson.

The knowledge that is documented, legitimized, and validated in the interactions between the individual, their colleagues, and objects occurs at both an abstract (circles) and concrete level (arrows)(see Figure 1). As the researcher, I anticipated being able to directly observe the concrete knowledge being produced such as a unit exam or professional conversations but that I would have to ask the participants to describe the abstract knowledge that might be produced in these interactions. The social interactions that occurred between the individual and her colleagues within the knowledge culture would be expressed through informal learning activities such as problem solving, performance planning, or analyzing student data.

In summary, through the analysis of the informal learning processes of teachers within this knowledge culture, I was able to examine how teachers were producing knowledge together, the objects that they were using and producing, and the practices that they enacted within their knowledge culture. Consequently, I gained an understanding of the interdependence between individual and social processes in teacher learning. I also examined how teachers were able to

co-construct knowledge and investigate the impact this had on their teaching practice in the classroom. In the next chapter, I will examine the methodology of interpretive inquiry that was used and demonstrate how this methodology allowed me to investigate my research questions. I will also provide detail on the methods I used to complete data collection and analysis.

Chapter 3 - Methodology

The methodology, interpretive inquiry, will be explored in this chapter. Interpretive inquiry is a framework that allowed me to gain an understanding of how the interactions between teachers and their colleagues and objects created learning opportunities for them. I developed insight and better understandings of the informal learning processes that were embedded within the knowledge culture, and of how teachers produced knowledge in terms of their collective ways of accumulating, distributing, accessing, and applying knowledge.

In this chapter, I bring clarity to the epistemology, theoretical framework, methodology, and methods that were used to explore how teachers experience informal learning. I start with a description my epistemological position of constructionism and the ontological basis of my research, realism. I then progress into a description of my theoretical framework, interpretivism and hermeneutics. From here, I conclude with an explanation of interpretive inquiry, and the methods, analysis, and evaluation that I used.

Epistemology

Constructionism is the epistemological lens for my research. This paradigm provides the constructs around what I believe to be the nature of the phenomenon, the nature of the relationship between the researcher and the participant, and the range of possibilities of how to go about acquiring my research findings. Constructionism focuses on the social dimension of meaning, the influence culture has on us, and accepts the critical spirit (Crotty, 1998). It acknowledges that “all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world, and developed and transmitted within an essentially social context” (Crotty, 1998, p. 42). Knowledge in this sense is objective and detached, where bodies and minds together

construct knowledge in situated processes. It is an active process of inquiry that leads individuals from knowing to knowledge construction. According to Dewey (1938b), the act of knowing constitutes a series of actions where individuals are together trying to solve problems in particular contexts; knowledge is the end result of this inquiry process, where the meaning derived is stable and stands separate from the inquiries. For teachers, inquiry processes occur within their knowledge culture as they are together solving problems that arise in their classrooms, from curriculum implementation, assessment practices, and district and government policy initiatives. These problems encourage teachers to engage in critical discourse and work together to derive meaning and a consensus on their knowledge.

As a constructionist, the researcher constructs meaning from her engagement with the world they are interpreting (Crotty, 1998). Meanings are constructed as the researcher interacts with the realities of her participants and of the other members of the context she is studying. This interactive link allows for knowledge to be socially constructed and for the researcher to construct meanings as the relationships and research progress (Guba & Lincoln, 1994). Since each researcher will engage with the realities in her context differently, each researcher will then construct meanings in different ways (Crotty, 1998). Crotty (1998) argued that it is because of this, "there is *no* true or valid interpretation" [emphasis in original] (p. 47); there are only useful ones that remain as they are contested against those that do not serve a purpose. Constructionism also accounts for the objects that are a part of the human world. "[N]o object can be adequately described in isolation from the conscious being experiencing it, nor can any experience be adequately described in isolation from its object" (Crotty, 1998, p. 45). As humans engage with their human world, in terms of their interactions with other humans and objects, they construct

meaning. Objects are an inherent part of this construction process where they are either used or produced in the social construct.

For my research, knowledge is constructed socially between teachers as they interact with each other in their knowledge culture. As a teacher engages with the other teachers and the artifacts or objects of her workplace, she constructs meanings. A teacher also goes through a dialectical exchange and critical discourse with her colleagues to determine which knowledge remains in the knowledge culture and what does not. They go through inquiry processes of legitimization, validation, and documentation, which will lead to knowledge construction in their community. In my research, I engaged with the realities of the participants, their colleagues, and objects to socially construct knowledge of how teachers experienced informal learning. I progressively constructed meaning through the relationships I had with the participants, as the meanings were not derived in an instant. Rather, my research is the result of interpretations from the social experiences I had and the end result of shared inquiry processes.

The ontological basis of my research then is that reality is not out there waiting to be discovered but rather it is "a construct in which people understand reality in different ways" (Morrison, 2007, p. 24). Objects, symbols, or language can either have similar meanings within or between cultures or have different meanings between cultures. An example would be art in various forms. An art piece can be interpreted in the same way or it can trigger many different interpretations from the individuals interacting with it. Within the knowledge culture I studied, I sought to understand the various realities and meanings of how teachers within a particular community constructed a meaningful reality. I examined how they produced knowledge together through their informal learning processes. These meanings were derived from the objects, symbols, and language the teachers used, and provided further insight into how the teachers were

constructing knowledge together, in terms of what they produced or in how they used the objects to create, distribute, or apply knowledge. I recognize that the realities I was witness to were not an ideal, but rather they were historical and social constructs for those teachers in that school during those moments in time. In this sense then, there is a certain relativism to my findings, as different teachers in different schools will have diverse ways of knowing, based on their historical and social constructs. My research does not capture every possible reality, but rather is relative to the particular moments I observed and constructed meaning with and from the participants.

Constructionism accepts that there are multiple realities that are socially constructed and that individuals see the world through their own lens of experience. Individuals that are a part of a community or culture will quite often share similar realities since the realities are socially constructed. In my research, I observed how teachers interacted with their colleagues and the various objects within their knowledge culture to better understand how the teachers experienced informal learning. Through the interviews I conducted and in my interactions with the members of the knowledge culture, I also explored the multiple realities that exist and gained an understanding of how each of the teachers experienced informal learning and the impact this had on their teaching practices. From the interpretations I made of these multiple realities and meanings, I constructed an understanding of how teachers are learning informally within their knowledge culture.

The methodological basis for constructionism is that the findings that are constructed are emic, as they stem from the interaction and relationship between the researcher and the participant and from the lived experience of the participant. The findings are interpreted using hermeneutical techniques, such as the hermeneutic circle, and a dialectical interchange or critical

discourse (Guba & Lincoln, 1994). This allowed me, as the researcher, to interpret and reconstruct the shared meaning in my own unique way and for me to cultivate a more in-depth understanding of the lived experience. Interpretive inquiry provided the necessary means for me to delve into how teachers were experiencing informal learning about their teaching practice. In this way, the informal learning processes of teachers were deconstructed, constructed, and reconstructed.

"Constructionism takes the object very seriously" (Crotty, 1998, p. 48) and my research reflects this, as my conceptual framework incorporated objects as part of the knowledge production process of the participants. As a qualitative researcher, I will need to be a *bricoleur*, which as described by Lévi-Strauss (1966), is a "Jack of all trades or a kind of professional do-it-yourself [person]" (p. 17). A bricoleur is insightful, creative, imaginative, and reflective about the context he/she is observing and interacting in (Crotty, 1998). A bricoleur is preoccupied with the objects and pays them considerable attention. As Crotty (1998) explained:

> We [must] not remain straightjacketed by the conventional meanings we have been taught to associate with the object. Instead, such research invites us to approach the object in a radical spirit of openness to its potential for new or richer meaning. It is an invitation to reinterpretation. (p. 51)

Throughout my observations and during the interviews with the participants, I examined the social processes of inquiry, how the teachers constructed knowledge, and the objects being constructed and used in the participants' learning processes to discern meanings from different perspectives.

Theoretical Framework

The interpretivist approach "looks for culturally derived and historically situated interpretations of the social life-world" (Crotty, 1998, p. 67). Within interpretivism, I have chosen the historical stream of hermeneutics to inform my methodology because it provided me with the means to deconstruct, construct, and reconstruct. I was able to use some of the ideas and concepts from hermeneutics to reflect on and guide my research and interpretive process. The central ideas of hermeneutics that informed my methodology of interpretive inquiry extended from the nineteenth century conservative hermeneutic tradition of Friedrich Schleiermacher's work and Gadamer and Ricouer's later works on moderate hermeneutics.

Hermeneutics strives to demonstrate the interconnectedness between and amongst individuals, both in ecological and ecumenical terms, through the continual search for understanding and meaning (Smith, 1991). Schleiermacher (1819/1977) defined hermeneutics as "the art of understanding" (p. 96), where the discourse and understanding of a text are related to each other. It encompasses interpreting or understanding language in all its forms and "examines human understanding in general. All understanding is linguistic, and nothing that involves knowledge or seeking knowledge escapes the domain of hermeneutics" (Gallagher, 1992, p. 7). There is a living awareness of language and hermeneutics provides a discussive continuum to theorize meaning within subjectivities, particularly in regards to the practices or events humans participate in. The learning processes I observed and asked the participants to describe were enmeshed in language. From the events they participated in, to their learning and teaching practices, and the understandings they have of their learning within their knowledge culture were all rooted and shaped by language. As such, the use of some of the central ideas of hermeneutics to inform my interpretive inquiry process allowed me to gain an understanding of how teachers experience informal learning within their knowledge culture.

Methodology - Interpretive Inquiry

Interpretive inquiry may at first seem random and chaotic since there are no procedures for interpreting. However, "interpretation is the working out of possibilities that have become apparent in a preliminary, dim understanding of events… It provides a way of reading, a preliminary initial accessibility, a stance or perspective (a fore-structure) that opens up the field being investigated" (Packer & Addison, 1989, p. 277). Packer and Addison (1989) explained that interpretive inquiry is "ordered and organized by the fore-structure of projection; the fore-structure guides the interpretation" (p. 277). It is not an undisciplined guess as to how to proceed or how to make constructions but rather, it is an organized process that is guided by the complexity of the relationship that exists between the researcher and participant (Packer & Addison, 1989). Interpretive inquiry provides a process that enables us to construct answers to our questions or concerns that we had at the outset of the research process (Packer & Addison, 1989) because the researcher is able "to develop insight or new learning that transforms the researcher's understanding such that he or she can think more richly and act more usefully in relation to the problem or question studied" (Ellis, 2006, p. 114).

The organized process that I used to gain an understanding of how teachers experience informal learning were informed using the elements of part-whole relationships and language and history from hermeneutics. Language is fundamental to hermeneutics, as it is thus that is interpreted. According to Schleiermacher (1832/1998), language is a union of speech and thought; it is "the manner in which thought is real" (p. 8). Crotty (1998) argued, "it is the language, the way we speak, that is considered to shape what things we see and how we see them, and it is these things shaped for us by language that constitute reality for us" (p. 88). The art of understanding language entails an understanding of the grammatical use of words and a

psychological interpretation (Schleiermacher, 1832/1998), where there is consideration of the individual who wrote or spoke the words in terms of their experiences, and historical and cultural influences. An understanding of utterances requires that both interpretations be equally considered in order to find meaning. This involves a circular relationship that revolves between the whole and a composition of objective and subjective parts. This is the hermeneutic circle where the objective is the grammatical interpretation, which is content orientated and focused on meaning of the text or utterance, and the subjective is based on the psychological interpretation, which involves placing oneself in the author or speaker's point of view (Gadamer, 1988). In using the hermeneutic circle, "the interpreter moves from the text to the historical and social circumstances of the author, attempting to reconstruct the world in which the text came to be and to situate the text within it – and back again" (Crotty, 1998, p. 95). Language is at the basis of understanding and the hermeneutic circle is a useful means to gain this understanding.

Throughout my research and interpretive process, I had a holistic view of the data I collected in the interviews and observations. By spending time with the participants in their workplace and getting to know them, I was able to get a sense of the historical and cultural influences of their knowledge culture and was better able to be considerate of the participants in my interpretations. I was also able to develop an understanding as to how my participants used language in their knowledge culture since utterances can have different meanings in different contexts. I continually moved back and forth between the literature basis of my research and the consideration of the participants and of the language used, the descriptions provided by the participants, and the meanings that were surrounding those descriptions. In this sense, I moved from the whole (context of the research, the knowledge culture, PD days and PLC meetings, my conceptual framework and the literature) to the part (participants' experiences and language used

during the observations and interviews). The movement through the hermeneutic circle provided opportunities for me to reflect on my data, the language and words used by the participants, and how this compared and/or contrasted to the research context and the literature. This guided my interpretive process. The multidimensional facets and holistic nature of this interpretive process allowed me the necessary means to acquire the required depths of interpretation and provided insight and understandings into how the teachers experienced informal learning within their knowledge culture.

The goal of interpretive inquiry is to be transformative, whereby the interpretations made provide new insight and understanding since, as Packer and Addison (1989) contended, "[a] true interpretive account is one that helps us and the people we study, that furthers our concern" (p. 279). Ideally, the aim of an interpretive account is to transform our understandings of the problem being studied and uncovers the possibilities for growth amidst the economic, political, and societal constraints in which we are currently immersed (Smith, 1991). In order to construct transformative interpretations, an examination of both the grammatical and psychological interpretations is needed. Complete knowledge of the language and the person is not possible, so a researcher must creatively construct "something finitely determinate from the infinite indeterminate" (Schleiermacher, 1832/1998, p. 11). There are no rules to guide this interpretive process and as such, Schleiermacher (1832/1998) argued, "the complete task of hermeneutics is to be regarded as a work of art, but not as if carrying it out resulted in a work of art, but in such a way that the activity only bears the *character* of art in itself" [emphasis in original] (p. 11). From the data I collected, I cultivated knowledge of the participants and meaning from their utterances in the interviews and observations. The interpretations I provide of my research are

transformative because they are unique from other research completed on teacher learning and they do provide new insight into how teachers learn informally within their knowledge culture.

My interpretive accounts are also transformative and creative because I have taken into account consideration of my pre-existing biases and perspectives. Gallagher (1992) argued, "interpretations are always constrained by the prejudices of the interpreter" (p. 12), therefore, a raised awareness of pre-opinions and prejudices presents opportunities for the researcher to uncover new interpretations and a shared meaning from her research, moving beyond pre-existing notions. I evaluated my interpretive accounts and identified and reflected upon my pre-existing biases and perspectives, both in terms of my personal views and those presented in the literature. This identification was presented earlier in chapters one and two, and the reflection on them occurred throughout my research and interpretive process, which allowed me to move beyond pre-existing notions and perspectives on teacher learning. The evaluation of my interpretations are explored in the next section.

Evaluating an Interpretive Account

To evaluate my interpretive account, I used Packer and Addison's (1989) four approaches: coherence, external evidence, consensus, and practical implications. Coherence emphasizes that a particular internal character to the account be provided and that the material that is presented makes sense (Packer & Addison, 1989). It is not a question of being valid but rather that the understandings are presented in a thorough manner and advance the knowledge surrounding the lived experience (Ellis, 1998b). Evaluation cannot simply be about validation (Packer & Addison, 1989). In order to ensure coherence in my interpretive accounts, I scrutinized my writing for information that did not make sense and had other peers and supervisors read my interpretations to ensure that my thoughts were intelligible.

With respect to external evidence, an interpretive account should be measured against a discriminating norm such as the researcher's intentions (Packer & Addison, 1989). In the writing of an interpretive account, triangulation or member checks can be used or participants can be asked to read through the interpretations to ensure that interpretations of what the participants said were correct (Packer & Addison, 1989). The researcher may also use "verisimilitude, emotionality, personal responsibility, an ethic of caring, political praxis, multivoiced texts, and dialogues with subjects" as criteria for evaluating their research (Denzin & Lincoln, 2009, p. 12).

As mentioned previously, I had my interpretive account edited and I also had conversations with my editors to ensure that my meaning was conveyed to readers. I wanted to ensure that readers would understand what I wrote and that it made sense. I also used member checks in my interpretive accounts. I had my participants read through the transcripts of the interviews to ensure that they were comfortable with all of the information that was transcribed. I also used the informal interviews and second semi-structured interview as opportunities for the participants to verify my interpretative accounts. In these interviews, I had conversations with them about the interpretations I had made about their learning experiences, I also repeated what they had said to me to ensure what I heard was accurate to what they meant, and I had them verify the descriptions I had written about them and the school context. I also had discussions with the participants individually and during the focus group about the PLC meetings and PD days to check the interpretations I was making from my observations with those of my participants. If the interpretations from those days were different, I then reflected upon and fully considered the alternative perspective that was present and used this reflection and consideration to evolve my interpretations. This reflection provided me with the opportunity of evaluating the interpretations I was making of my observations. In the writing of my interpretive accounts, I

took personal responsibility for ensuring I used the participant's voice in the descriptions of their experiences and was considerate and reflective of the language I used in my interpretive accounts. I cared for my participants and stayed true to their voice and the information they shared with me. I did not elaborate on or exaggerate the stories they shared with me. I recognize that "a uniquely correct interpretation [is not] possible since perception is interpretation and each person perceives from a different vantage point and history" (Ellis, 1998a, p. 8). However, having conversations with my editors to ensure coherence, having the participants check through the transcripts and verifying my interpretive accounts during interviews, taking personal responsibility, and having an ethic of caring provided the necessary discriminating norm for my research.

An interpretive account also needs to seek consensus among researchers. "An interpretation that can be called convincing should be communicable to others, should make sense to them and enable them to interpret new material in its light" (Packer & Addison 1989, p. 285). In the writing of my interpretive account, I sought input and feedback from my supervisor, committee members, and fellow doctorate students. I used the feedback they provided to help clarify my interpretive account and welcomed a passionate discussion around the meanings I made. Packer and Addison (1989) asserted that "discussion between researchers is clearly an essential aspect of interpretive inquiry" (p. 286) and I generated discussion of my interpretive account to ensure that an answer had been revealed.

In regards to practical implications, a researcher should attempt to predict the possible implications their interpretive account may have (Packer & Addison, 1989). Interpretive inquiry has the ability to bring about transformation in both the researcher and the participant and even has the potential to bring about change in readers. In the writing of my interpretive account, I

went through a continual reflection on the implications of my research. I considered the teachers I interviewed and their school community, along with the macro school community within Alberta.

Methods

Research Site and Participants

In order to find participants for my study, I completed unique sampling (Merriam, 2009) through a search of the Cycle 4 AISI projects and identified school districts that self-identified as having staff members work collaboratively, along with other forms of informal learning such as teachers observing other teachers or a lead teacher mentoring other teachers. I looked for a few school districts that epitomized the informal learning activities of teachers within their workplace. Upon identification, I e-mailed one Superintendent at a time, in order to obtain permission to complete research within that district. Only one of the identified school districts provided this permission. Once I had received confirmation to proceed, I sent e-mails to the principals of the schools within the district. One of the principals consented to allowing me to complete research at the high school and provided me with e-mail addresses for the teachers. I then sent a series of e-mails to the teachers asking for their participation in my study.

The criterion for participating in this study was that a teacher needed to have been teaching for a minimum of five years. Having teachers with at least five years of experience allowed me to work with participants who had experience and confidence in their teaching practice, and understood the culture of their workplace. Two teachers answered my original e-mail and agreed to participate in my study. Following a conversation with one of the participants, I e-mailed a few other teachers directly and asked them to participate in a more personable manner. From this e-mail contact, only two other teachers agreed to participate. At the end of my

search for participants, I had four teachers who consented to participate in this study. This sample size was practical and allowed me to obtain depth and breadth in my data collection. Each of them had been teaching for a minimum of five years and worked in a school that had been identified through a document analysis of the publically available AISI Cycle 4 reports.

My research took place within an urban high school in Alberta. The high school had teachers working within specific subject departments and provided a great opportunity to observe the teachers within the knowledge culture at their school. The participants in my study had different teaching assignments, which allowed me to observe different knowledge bases or specific teaching skill sets that are required in a subject area. This also provided me with the opportunity to attain a holistic understanding of the teacher learning mechanisms occurring within the school. The four teachers provided their consent to participate in a two-part study: first, there was a pilot study that lasted three weeks and consisted of an initial introductory meeting, one full day of observation, and an unstructured interview that followed the observation; second, there was a longer-term observational study that had a duration of five months and consisted of two semi-structured interviews, a focus group, and an observation process that included unstructured interviews occurring at different points during this process. They also agreed to writing a journal entry, and having various objects included in the data collection (i.e., professional e-mails pertaining to learning, final exams that were created, etc.).

Interviews and Observations

It was important during the interview process to have the participants feel comfortable enough to recall and reveal their learning experiences. As such, I decided to meet my participants in an introductory meeting and have them complete the research and ethics consent form. This meeting provided an opportunity for me to answer any questions the participants had about the

research process and allowed us to arrange times for the classroom observations. I met up with each participant soon after they agreed to participate in the study. The initial meetings occurred during May and June 2013 (see Table 1 for the specific dates and times for each interview). During this introductory meeting, we also set up a meeting time for the first semi-structured interview. After each meeting, I made field notes on the conversation that occurred with each participant.

The purpose of the first semi-structured interview was to get a sense of who the participant was as a person and to learn what the lived experience was about for her (Ellis, 2006). I had each of the four teachers complete a PIA prior to our first interview (see Appendix A). The PIA was a form of an unstructured interview in which the participant was able to reflect upon her learning and represent that reflection in a form of her choosing. It was an open-ended process that allowed me to gain initial insights and understanding of how each participant experienced their learning, since the PIAs allowed the participants to become comfortable with the research process and provided a basis for conversation in the first semi-structured interview (Ellis, 2006). I e-mailed the list of PIAs a week before the first scheduled interview and asked the teachers to complete one of the four activities for the interview. This process occurred shortly after the initial meeting (see Table 1). This was respectful of their busy teaching schedules and ensured they had enough time to complete the PIA.

After I had the participants explain their PIA, I then asked the participants a series of predetermined questions that were the same for each participant (see interview guide Appendix A). The questions asked were meant to bring about conversation on learning and served as prompts to help the participant recall ideas, memories, thoughts, and experiences (Ellis, 1998c; 2006). These open-ended questions facilitated movement through the objective part of the

Table 1
Data Collection Details: Types of Interview or Observation, Dates, and Times for Each Participant

	Dates[a] and Times for Each Participant			
Type of Interview or Observation	Michelle	Spirit	Ashlee	Willy
Introductory Meeting	May 2 90 minutes	May 2 90 minutes	May 30 30 minutes	Same as first semi-structured interview
First Semi-Structured Interview	June 26 103 minutes	June 19 82 minutes	June 17 34 minutes	June 17 44 minutes
Special Education PLC First Observation	May 8 180 minutes			
First Classroom Observation	September 11 180 minutes	May 14 180 minutes	September 12 200 minutes	September 12 180 minutes
First PD Day	September 13 180 minutes	September 13 180 minutes	September 13 180 minutes	September 13 180 minutes
English PLC First Observation		September 13 180 minutes	September 13 180 minutes	September 13 180 minutes
Second Classroom Observation	September 24 120 minutes	September 24 90 minutes	September 25 180 minutes	September 25 180 minutes
Journal Entries	Submitted end of September	Submitted end of September	Submitted end of September	Submitted end of September
Second PD Day	October 11 180 minutes	October 11 180 minutes	October 11 180 minutes	October 11 180 minutes
Special Education PLC Second Observation	October 11 180 minutes			
Third Classroom Observation	October 15 180 minutes	October 18 180 minutes	October 17 180 minutes	October 18 180 minutes
Second Semi-Structured	November 7 65 minutes	November 6 77 minutes	November 8 36 minutes	November 25 30 minutes

Interview				
English PLC Second Observation		November 22 180 minutes	November 22 180 minutes	November 22 180 minutes
Focus Group	December 10 27 minutes	December 10 27 minutes	December 10 27 minutes	December 10 27 minutes

Note. [a]All dates were in the year 2013.

hermeneutic circle. This interview was where I established rapport with my participants and how I was able to get to know them. It was also an opportunity to gain understanding of some of their teaching practices and past learning experiences. This allowed me to generate a general idea as to who they were as a professional learner and assisted my movement through the subjective part of the hermeneutic circle.

During my initial observations, I used the observation table and the list of questions I had created to facilitate this process (see Appendix B). My field notes were based on this table and list of questions as a way to guide my observation process. This guide was helpful to keep my observations and field notes focused on my research questions and to help my movement through the objective part of the hermeneutic circle. I was able to identify and make note of informal learning activities that occurred and then provide specificity to the observations through the use of the questions. For example, when a participant was talking with another teacher, I would listen to how she described a problem she had and then how the other teacher would respond. I would then look to see if the participant had implemented the idea from her colleague or ask her about it in an interview.

The observation table and questions also provided a means for me to identify and recognize the dynamics of the knowledge culture. When the participants were interacting with

their colleagues or students, I would indicate the informal learning activities they were participating in and how they were validating, legitimizing, or documenting knowledge. For example, I identified the teachers validating knowledge when they used language such as "I agree" or "that's correct". To identify legitimization, I listened for conversations where the teachers were contemplating a teaching practice or trying to solve a problem. Their critical discourse and eventual consensus was their legitimization process. For documentation, I identified this according to what they were recording during their PLC meetings or PD days in terms of a word document on the screen or in how a participant would describe what another teacher had provided her in terms of resources or teaching strategies.

After the initial classroom observation, I observed each of the participants at different points during a PD day and at one of their PLC meetings. I then followed these observations with a classroom observation, informal interviews, and the journal entry (see Appendix C). Subsequent observations occurred at a second PD day and a second PLC meeting, each with informal interviews and followed by classroom observations. I chose this format because I wanted to see if the social learning experience the teachers were involved in during a PD day or PLC meeting would have an impact on their teaching practice and to examine the impact of infrastructure, professional relationships, and practices on their learning. I observed the PD days and PLC meetings in order to see the participants interacting with their colleagues in their knowledge culture and to see the mechanisms and tools they were using to co-construct knowledge. These observations presented rich opportunities to see the participants learning with their colleagues and to provide data on the interdependence between formal and informal learning and individual and social processes in their knowledge culture.

From the first semi-structured interview, the classroom observations and those made during the PD days and PLC meetings, and the informal interviews, I created questions for the next hermeneutic circle of my inquiry. The second semi-structured interview provided an opportunity to ask more in-depth questions that came from the subjective part of the hermeneutic circle I had entered into in the previous interview. The second interview guides were different for each participant because they each had different learning experiences during the PD days and PLC meetings and each of their classrooms were different (see Appendix D). The questions asked in the second semi-structured interview were designed to seek clarification to the questions that arose in my initial interpretations and to verify them, to ask any questions that arose during the observations, and to create opportunities for the participants to describe their experience of what I had observed (i.e., experience of learning in a PD session).

After the second semi-structured interview, I entered another hermeneutic circle in my interpretive inquiry where I had the teachers participate in a focus group. For this session, I created a question guide (see Appendix E). This guide was based on interpretations that arose from the collective data where I found similar learning experiences occurring for each participant. The participants and I met together over a lunch hour and I posed the questions to the four of them and they carried out conversations based around them. The focus group was meant to be an informal learning opportunity where the participants could reflect with their colleagues about their learning. It was a chance for me to observe and listen to the teachers speak about the impact infrastructure, professional relationships, and practices have on their learning and the interdependence they experience in their individual and social learning processes.

The six-month timeframe for this study and the number of participants, observations, and interviews were quite sufficient for attaining saturation in my data collection and to allow me to

complete the necessary circles in my interpretive inquiry. In total, I made three classroom observations for each participant and observed two PD days and two PLC meetings (see Table 1). I reached data saturation of themes after completing the second semi-structured interview and second English PLC observation, as the data collected here repeated the themes that I had already identified and provided further confirming evidence for these themes. These themes were again confirmed in the focus group.

Analysis and Interpretation

Each of the semi-structured interviews and the focus group were recorded and transcribed. After reading through the transcripts and verifying them, I sent the transcripts to the participants for their approval. The participants reviewed the transcripts for their individual formal interviews and for the focus group, and sent me an e-mail indicating their approval for use. Upon verification, I began analysis of the transcripts, my field notes, the journal entries, and the PIAs. To guide this process, I used Polkinghorne's (1995) analysis of narratives framework.

To begin the process, I created a list of different concepts and terms I gleaned from the literature review on informal learning and knowledge cultures that were directly relevant in answering my research questions (i.e., all of the informal learning processes; short- and long-term learning loops; validation, legitimization, and documentation of knowledge; tools/objects). These were the same terms that I used to guide my observations (see Appendix B). As I read through the transcripts, I also noted common themes and conceptual manifestations among the stories and experiences shared with me (Polkinghorne, 1995) and focused on the language and utterances that the participants were using. From this paradigmatic analysis of narrative, I generated a second list of themes from the transcripts (i.e., importance of relationships; trust; conflict or disruptions in their learning; knowledge) and then cross-referenced these with the first

list of concepts and terms. I then narrowed these down to a smaller group of more specific themes (i.e., informal learning processes, short- and long-term learning loops, members of the knowledge culture, relationships and trust) and went through the transcripts again, along with my field notes, the journal entries, and the PIAs, highlighting the participants' experiences and phrases that aligned with the themes and that questioned, surprised, or prompted me to reflect upon the research question and sub-questions in new ways. Each theme had their own colour of highlighter and I categorized and organized the participants' experiences and phrases according to how they answered the research question and sub-questions. I went through this analytic process throughout the six months of data collection, where I would analyze each set of transcripts upon verification and analyze my field notes, the journal entries, and PIAs shortly after they were collected. This allowed me to go through as many hermeneutic circles as was necessary in my interpretive process, and recognize new insights as they emerged from the participants' experiences. In this manner, I was able to identify new interpretations and insight into how the participants were learning informally, and to construct general knowledge from the lived experiences of the participants (Polkinghorne, 1995).

For the objects that are documents, I analyzed them using document analysis. Fitzgerald (2007) identified documents as being "texts that can be published or unpublished, written, oral and visual and may reside in either public, private or virtual domains" (p. 281). From my observations, the documents included e-mails, final exams, and teaching resources. The documents I analyzed were a part of the knowledge production process where teachers used them to produce knowledge or created them in the process. In order to analyze the documents, I used the same coding system as used previously on the transcripts and my field notes, since document

analysis involves "locating underlying themes in materials, analyzing these themes and providing an interpretation that augments a theoretical argument" (Fitzgerald, 2007, p. 287).

The design of this study enabled me to generate findings and interpretations to attain the goal of this study, which was to gain an in-depth understanding of how a teacher experiences informal learning. The various data sources were specifically selected to ensure a holistic interpretation of a teacher's experience would be attained and then four participants were used to provide different perspectives of this experience. Evidence from many sources provided accuracy of the information gained and a means for me to crosscheck the data to establish validity (Bush, 2007). It also allowed for the similarities and differences in the experience of informal learning to be identified and reflected upon. Throughout my interpretive process I had my work edited to ensure that my meaning was conveyed to readers, used member checks in my interpretive accounts where I had the participants check through the transcripts and verify my interpretive accounts during interviews, and also took personal responsibility and care when writing my interpretations. All of these processes allowed for reliability and for me to present an interpretation of the data that was supported by evidence and grounded in theoretical knowledge. From the multidimensional and holistic nature of my design and interpretive process, I was able to gain in-depth understandings as to how the teachers experienced informal learning.

Ethical Considerations

I used pseudonyms for the participants in the study, their students, school, and school division, in order to protect the identities of the teachers, students, and the school. My research study provided an opportunity for the teachers to learn more about themselves and the learning processes they go through at work. The participation in my research study may have been uncomfortable for them as they learned new things about themselves, but it also contributed to

their professional growth. The research study may have been uncomfortable for them because they may have revealed stories in the interview process that they had not planned to. However, I ensured that the teachers were fully aware of the nature of my study, that the interview process could have been stopped and that they were able to withdraw their participation at any point during the research process. During an unstructured interview where I debriefed an observation with a teacher, I ensured to allow the teacher opportunities to ask questions about their experience. I also asked the teachers to read through the transcripts to ensure they were comfortable with how it read, in terms of the correct translation to written form. The ethical standards and protocols of this study conformed to the University of Alberta Research Ethics Board guidelines and this board approved each phase of this study.

Summary

Interpretive inquiry is a qualitative approach to research and allows a researcher the opportunity to provide new insight and understandings through her interpretations of the lived experience of a participant. In the described interpretive inquiry process, I used some of the central ideas of hermeneutics to reflect on and guide my interpretive process and to deconstruct, construct, and reconstruct interpretations. The interpretive inquiry methodology provided the necessary mechanisms for me to interpret how a teacher perceives and understands her informal learning within her knowledge culture and the impact that this has on her teaching practice. It also allowed me the opportunity to uncover and develop an understanding of the interplay between the formal and informal learning of teachers and the individual and social processes in teacher workplace learning. The interpretive inquiry methodology allowed me to provide further insight into the mechanisms and tools of a teachers' workplace and how she facilitates the co-

construction of knowledge with other teachers and the impact of infrastructure, professional relationships and practices on teacher learning.

In the subsequent chapter, I describe the research context and provide a characterization for each of the participants. I also provide analysis of the data collected and a discussion of how the participants experienced informal learning.

Chapter 4 – Informal Learning Processes

Chapters four and five employ the interpretive inquiry approach described in chapter three. Utilizing this interpretive process, I focused on the particulars of the data collected that questioned, surprised, or prompted me to reflect upon the research question and sub-questions in new ways. I have divided my findings into two chapters to better represent the individual and social processes in teacher workplace learning and the part-whole relationships. This chapter will address the part-whole relationships through an examination of how the participants perceived and understood their informal learning within their knowledge culture and the impact this has had on their teaching practice. From the data collected in the first semi-structured interview, my observations and field notes, and the informal interviews, I will examine and describe how the participants validated and legitimized knowledge with their colleagues, and how they documented and legitimized knowledge with the objects of their workplace. These understandings are narrower in scope and incorporate more of a focused perspective on the research questions and sub-questions, as they come from the participants' past learning experiences and from my observations and conversations with them in their daily teaching practice.

In this chapter, I will begin with a description of the research context and then characterize the participants and their learning experiences, and provide commentary on the classroom observations I made of each participant. I will then move from a part to whole reflection in exploring the common themes that emerged from the analysis of interview and observational data and conclude with a synthesis of the participants' informal learning and knowledge construction processes, and the practices they enacted individually and collectively within their knowledge culture.

Regional Context

School Division

My research occurred in an Alberta school division that encompassed a large rural area near an urban center. There are many schools located throughout the district and a variety of educational programs provided in these schools to support a myriad of student learning. Programs are offered from K-12 and include gifted and talented programming, a special needs program, Advanced Placement and International Baccalaureate curriculums, K & E courses, and several CTS courses. The focus of the school division is on creating positive learning environments for students and ensuring student success through a collaborative approach, which involves parents, teachers, students, trustees, and community members. The district is currently placing emphasis on literacy skill development where teachers are working with students to develop critical thinking and problem solving skills.

School

Data collection occurred at one of the high schools within the school district. This high school has approximately 1200 students registered in grades 10-12. On staff, there are 60 professional staff and 20 support staff members. This school offers many of the programs seen in the district, with a particular emphasis on CTS and arts courses. The variety of programs offered ensures that the different needs of students are met. The school has a very good reputation within the district, consistently having a high enrollment of students. The staff and students have established a very warm and accepting environment, and new students feel that they are a part of the school community. Ashlee, one of the participants, explained during the focus group, "students come to this school because there is a place to fit. Everybody has a spot. If a student is being bullied at another school, they come here because they will find friends." One interesting

aspect of the school is that many of the teachers who are currently working at the school also attended the school as students themselves.

When asked about their school, a few of the participants made comments on how the school has had troubles in the past, in terms of conflicts amongst some staff members and diploma exam marks not meeting provincial standards. However, all four participants agreed that this is no longer the case and that the school is in the process of recovering from this. Members on staff are working towards improving student achievement and developing healthier interactions with other staff members. In the focus group, Ashlee acknowledged that the school may have had a negative reputation, but it is changing and there is "a heck of a lot of positives that we can't forget about." Spirit, another of the participants, also commented, "we've got some of the most amazing colleagues that I've had a chance to work with." The staff is working hard to ensure that it is not only students who have a place to fit, but also all staff members.

Participants

In this next section, I will provide a characterization of each of the participants. This characterization will provide insight into who the participants are and how they perceive and understand their teaching practices and learning. It will be developed from the formal and informal interviews conducted and the classroom observations I made.

The four research participants were all from the high school and had all been teaching for more than five years; three of them were a part of the English PLC that had ten teachers and the fourth participant was a Special Education teacher. She worked in a PLC that consisted of herself, an administrator, and four EAs. At the beginning of the first semi-structured interview, I had each of the participants select their own pseudonym.

Michelle

Michelle is a Special Education teacher who has been teaching for almost ten years and is passionate about teaching and working with special needs children. She has completed her Masters degree on inclusive education and is seeking an administrative position. Michelle facilitates one of the Special Needs programs within her school. She is in charge of planning all aspects of the program from lessons and creating individualized programs for her students, to booking weekly field trips/excursions, and managing her support staff.

Michelle works very closely with her EAs, has strong personal and professional relationships with them, and encourages their feedback and suggestions on program planning.

> I'm kind of that lone island and I have my support staff that are my people that I converse with, "What do you think we should do that's different?" They're an *expert* in this field because they're with me all of the time, so I really rely heavily on *them*. (first semi-structured interview)

Throughout the school year, she sits down with her EAs and asks them to reflect on how the classroom programs went and any improvements they would make. This oral reflection on the programs allows them to brainstorm ideas for the next year and improve their program. Since Michelle does not have other teachers to work with directly in her Special Education program, she must go out to make connections with other teachers. She does this through site visits, blogging and the use of Twitter, attends conferences, and reaches out to other teachers in the district or nearby districts that have programs similar to hers.

Michelle has learned throughout her career that relying on others is a big part of her job, along with the experience of going through something and making mistakes. She has learned that it is okay to admit she needs help and reach out. “I think just asking, going out and asking for the help, and not expecting that it’s just going to come to you… To know that there are people out

there to help you, that you're not on your own. I'm learning more and more how to do that" (first semi-structured interview).

Michelle views the school year as an opportunity for many learning experiences, as she is "constantly learning the intricacies of teaching" (journal entry). She likes to try new pedagogical strategies and admits that "sometimes I have to learn the hard way [laughs]" (first semi-structured interview), where she is learning from making mistakes. She values collaboration with others and the brainstorming that occurs.

> I think the way I've been learning, honestly, it's through experience. I think a lot of stuff I've talked about, I've had to go through it to really get it. Myself, just learning in general, I am a person that needs to be hands-on. I need to *do* it to really get it... And I think its self-reflection with it, right? I think you do something and you kind of go, "Okay, what worked really well and what didn't work really well, and why?" And that's, I think, learning. (first semi-structured interview)

Classroom observations. Michelle's classroom is located close to the school office but off in a corner of the school. Her classroom is quite large; her desk area and a Promethean board are near the front of the room, and there are four computers in the classroom for her students. The students' desks are arranged in a semi-circle and their work is displayed on the walls and bulletin boards, along with schedules for the day and various pedagogy posters. The semi-circle allows the students to see each other as they participate in class activities. Michelle commented, "Our desks are here, in the horseshoe, because we do morning sharing, so it's just easier for everybody to be together as a group" (second semi-structured interview). The students share aspects of their personal lives such as what they did the night before or over the weekend, and then Michelle and the EAs take their turns sharing. This helps to build relationships and for

students to see them more as persons. There is a washroom and kitchen across the hall and another classroom next door that they use. It is a friendly, welcoming space, where the door is always open.

In the classroom observations I made, I found Michelle to have a relaxed and respectful rapport with her students. It was evident that she truly cared for them. Michelle also had a great rapport with her EAs; it was respectful, easy going, and professional. They each knew what to do and picked up from one another as they moved the students through the various activities of the day. The EAs were often seen sharing information regarding various students with Michelle. Michelle described these meetings as being impromptu, as they occurred when her and the EAs found a moment to talk and usually happened in the hallway or bathroom. Michelle remarked, "I joke with everyone saying, "Our conference room is our bathroom because that's the only place that our kids will leave us be, since they're working in the other rooms."" (first semi-structured interview). These impromptu meetings allow for Michelle to know how each student is doing and how they are progressing during the day. She explained to me during an informal interview that the nature of a Special Needs child is one that can change throughout the day and that her and her EAs need to be adaptable to provide the best possible programming for their students. With the information she is receiving, she is able to adjust activities during the day to suit each child's ability.

Spirit

Spirit has been teaching for over 30 years and works part-time teaching English. She has a Master's degree and significant experience working with K & E students. Relationships with both her students and fellow staff members are important to her. Spirit has a keen sense of humour, values being kind to others, and wants to be viewed as ethical from others. "I think all I

can do is look after myself and to make sure I am behaving ethically and hopefully that comes across to my students…I *hope* that's my reputation" (first semi-structured interview). The pseudonym she chose has spiritual and relational connotations, and I found this consistent with Spirit's personal characteristics and how she described her learning.

Spirit commented that she is happy at this point in her career, "I have a real balance in my life and I don't want to change it right now…. Right now, it's still a joy, right? Because I'm still learning. When it becomes onerous, then I need a change" (first semi-structured interview). Spirit has pondered retirement but she enjoys teaching and her students. "So I say, "What do I like about my job?" I love my students, I love new curriculum… and I'm still finding *great* resources for my class. It defines who I am and if I'm doing something *beautiful* that I love, it beats cleaning out closets and ironing, which I don't love" (first semi-structured interview).

Spirit has only been teaching English on a regular basis for the past few years so most of the curriculum is new to her. She uses a website, TES (think, educate, share), on a regular basis to obtain resources and is quite enamoured with it, as "having to update my resources has rejuvenated me" (introductory meeting, field notes). She showed me all of the lessons she obtained from the TES website and shared her excitement about discovering this new community, "Realizing that there's an online community of teachers that are willing to share their expertise and knowledge! I had to download and make copies" (first semi-structured interview). Over Spirit's career, the availability of resources has changed and her fascination with this website is in part due to this. She stated:

> At the beginning of my career, I was all alone! There were no resources. I was in Special Ed before there was Special Ed. So we had to—actually, it's done me in good stead. I had to develop everything. There was nothing there. I walked into empty classrooms with

> behaviour-disordered junior high kids. Now, I can go on the Internet and I can find exams, and I don't have to make it all myself. (first semi-structured interview)

Classroom observations. Spirit's classroom is within an older part of the school. It is a traditional classroom with white boards and the Promethean board at the front, rows of student desks, and her desk and computer at the back of the room. While observing Spirit teaching, I noted that she has a very good rapport with her students. She would ask them questions about school and their personal lives and they would answer her questions and share stories with her. Throughout her classes, students asked questions during her lessons or during work time. They seemed comfortable to be able to ask questions and were appreciative of Spirit's help.

Quite often in her lessons, Spirit would share with her students how she is learning and explain how she makes meaning out of things she does not understand. For example, in a passage she was reading from *Macbeth*, there was a reference to the Bible. She told her students that when she first read this passage she did not truly understand the reference. She explained how the Bible is a respected text and that quite often there are references made to it in literature. She showed them how to Google this passage to determine its' meaning and then explained the meaning in her own words and related it to the context of the play.

Ashlee

Ashlee has been teaching for almost ten years and works part-time. She has a Special Education background and is currently teaching CTS modules on medical studies and an English course. Ashlee is relaxed, easy going, has a calm disposition, and a good sense of humour. Ashlee has always wanted to be a teacher and the relationship she has with her students is her favourite part of teaching. "I have known forever that I would be a teacher. I babysat, taught piano, skating…anything that allowed me to work with kids... Interacting with them is the

absolute best part" (PIA). She has two children and the experience of being a parent changed her as a teacher. Ashlee is more empathetic now as a teacher and considers situations based on how she would feel as a parent and how her children would feel if they were in the situation. Ashlee described an example:

> Supervision has always been an issue. And one teacher said, "Well, why don't we just bring them all into the gym and they can sit on the floor and eat?" I'm like, "That's disgusting! We're not doing that." And again, that's because I put my own kids in that position and I wouldn't want it done. (second semi-structured interview)

In her PIA, Ashlee chose to reflect on her career as a teacher through writing. She described teaching Special Education classes as one of the most important things that she has done in her career so far. Teaching Special Education presented many learning opportunities for Ashlee, both professionally and personally, and allowed her to grow as a teacher and as a mother.

> It taught me that students learn differently and that everyone has strengths and weaknesses. It taught me what is important, that everyone deserves opportunities and chances. My own children have also been inspirational. Before I had children I found that I sometimes would rely too much on what the "experts" or the books would say. After having children, I realized that it was much simpler than that. Treat students like people; earn their respect and the results will be astounding. (PIA)

Classroom observations. Ashlee's classroom is closer to the office and has a very warm feeling to it. The students desks are in pairs and spread out in the room, with some of them being in traditional rows. She has her desk up at the front, along with a Promethean board and bookshelves. Around the room are many projects students have completed and equipment for her

medical studies classes (i.e., bed, mannequins, anatomy models). Near the back of the room there is another desk where her EA sits. Ashlee has a very good rapport with not only the students in her classes, but throughout the school. This was evident through all of my observations and in the time I spent with her. She truly cares about her students and develops good relationships with them. Ashlee has an infectious laugh and there was a lot of laughter in her classroom as students shared stories with her and as she in turn bugged them or shared stories with them.

One of the mornings I observed Ashlee, she was instructing one of her medical studies courses. The class was relaxed but Ashlee moved the students through their work efficiently. Throughout the class and in other classes observed, the students readily asked Ashlee questions. Students had asked her questions about the worksheet they were filling in. To help them narrow in on the right research, she provided them with some advice and then had them star certain parts of the worksheet to keep them focused on their task. She shared with me afterwards that she was prepared for these questions, as a previous class had some of the same concerns and from this, she knew how to guide this class.

In her teaching, Ashlee will quite often share personal stories with her students. As she taught the medical studies courses a few weeks later, she shared relevant stories from previous students who shared information with her or from her own experience with an illness or anatomical disorder. For example, she shared a story of one of her previous students who had a hearing disorder and how the information they were taking notes on was from what she had learned from this student. Ashlee explained to the class what daily life was like for this student. She also shared the description of what the world sounded like through the ears of that student, as this student had described it to Ashlee. The story Ashlee shared provided an avenue for students to relate to the information in new ways.

Willy

Willy has been teaching for just over ten years and is currently teaching art, fashion studies, and English. She is very friendly, artistic, creative, and free-spirited. In Willy's choice of pseudonym, she selected a male's name. This signified to me her creativity, uniqueness, and unease with participating in a research study. Willy described herself as being very emotional and empathetic. Relationships are very important to her and this was seen in the many warm relationships she had with her students and colleagues.

In her PIA, Willy drew an illustration of the different ways she learned as a professional. She illustrated obtaining knowledge from books, her colleagues, her students, and various forms of technology such as computers and websites (i.e., Pinterest). She has to attend PD activities away from the school, as the knowledge needed for her courses does not always come from books. She wished her school "would support more collaborating and doing hands-on things; workshops where you get to use your hands and watch other people learn, because that's another way to learn" (first semi-structured interview).

Classroom observations. Willy's main classroom is in the older part of the school and has her student desks arranged in traditional rows and a Promethean board at the front. Her desk is situated at the back of the room and on her bulletin boards she has placed several writings that students have completed. Throughout the day, Willy moves to different rooms for her art and fashion studies classes. Each of these rooms is colourful and dynamic, with lots of student projects and art on display. Each of her rooms is full of energy, as students chatter with themselves and with her. Willy has a very good rapport with her students, as they shared many laughs and stories with each other.

Being an artist herself, Willy is empathetic and sensitive to her students' needs and will use humour or share stories with students to redirect their behaviour or learning. In one of her English classes, she was reading aloud a chapter of a book they were covering. At one point she stopped reading because a group of students were whispering and not paying attention. She waited until the students quieted down and were paying attention. She then shared with them her weakness of reading aloud and how it was hard for her. She said she had difficulties reading and when people were distracting her, it makes her stutter and mispronounce words even more. She asked them to stop being disruptive, as how would they feel if someone was making reading harder for them. This proved powerful for the students, as they remained quiet for the duration of the reading and really seemed to respond to her need for them to be quiet. They respected her and what she had shared. She showed them her vulnerability and expressed what she needed. This was a learning opportunity for them. In the second semi-structured interview with Willy, I asked her to expand on this experience from her perspective:

> If they're being disruptful then my brain starts, "Okay, well, I gotta do this when I get home," and then I forget what I've read and I'm not passionate and I'm not using good voices and they're not learning. So that's why I have to get them back on track. It's not easy to sit in a class for 85 minutes. My gosh! I totally understand that.

In her art class, Willy would quite often share tricks on how to complete a certain technique. This was based on what she had learned from completing the technique and attending workshops. I also observed Willy doing this in her fashion studies class. She demonstrated how to thread a sewing machine and then shared with them all the little tricks she had learned over the years to do this more efficiently. These tricks helped her students pick up this skill a little faster

and I heard some of them repeat these suggestions, as they helped their peers throughout the class.

Themes Emerging from the Research

In this section, I present and discuss the themes, informal learning processes and other members of the knowledge culture, as they pertain to the participants' individual experiences that were described in the first semi-structured interview, informal interviews, and classroom observations. I focus on the language used by the participants and their utterances as exemplars to support the interpretations and to convey meaning. The findings presented in this section provide insight into the research question and sub-questions in terms of how the participants perceived and understood their informal learning within their knowledge culture, how they co-constructed knowledge, the interplay between their individual and social processes in their workplace learning, and the impact this has had on their teaching practice.

Informal Learning Processes

In carrying out their work activities and teaching practices within the school, the participants were learning informally. In my examination of the text as a whole, the informal learning processes that were observed and described by the participants included trial and error, asking questions, sharing and comparing work or ideas, modeling teaching practices, problem solving and brainstorming, and reflecting and checking for understanding. Many of these processes would occur concurrently during the conversations the participants had with each other, their students, or other colleagues.

Conversations were an important part of the informal learning process for the participants. In these conversations, teachers would ask each other questions, try to gain ideas on how to solve a problem, or share information with each other. It was a context for the

participants to reflect together with their colleagues or students and then individually once they left the conversation. When Michelle described her working relationship with her EAs, she commented, “I *love* talking to people and saying, "What do *you* think? What did *you* do about that?” I guess that comes in with the PLCs, the communities, and that's the whole point of it, right? To sit and throw ideas around and learn what works well and what doesn't” (first semi-structured interview). Michelle asked these questions of her EAs to encourage them to share their thoughts on their program and for them to reflect and brainstorm new ideas together. Michelle also described wanting to have conversations with other Special Education teachers to compare her program to another’s, to compare the resources she used to theirs, to get ideas or advice, and to gain their perspectives on issues. “To just sit and do a powwow with a whole bunch of people and say, "What kind of kids do you have? Like, how do you deal with that?" Or, "What does *your* daily schedule look like? What do *you* do different?"” (first semi-structured interview). These questions would encourage the teachers to share what they do in their programs, providing an opportunity to reflect on one another’s programs and to gain a deeper understanding from someone else’s experience.

Spirit used the phrase, “tell your story” during the first semi-structured interview when she described how she would share stories of students or rationale for decisions she made with her administrator. The use of this expression establishes the need and importance for sharing knowledge between colleagues. Spirit also described some of her best learning as occurring in the parking lot or when on supervision because she was out of her classroom and able to talk with other teachers. As Spirit and her colleagues were sharing stories, Spirit would learn from their experiences. She explained:

> I've learned so much. Like in the parking lot, I was talking to a teacher and we talked about something in common, "Oh, I didn't know you had that problem." And again, that's getting out of the isolation, and that's not in the *formal*—when you're talking about how teachers learn. You know, in the formal meetings, they're very structured. They're very organized. There's very little room for interaction. So when do we interact in an isolated profession? On supervision! As I'm leaving and my partner is coming up to do supervision. That's when we stop and chat for a few minutes, like, "Oh, yah, because that boy over there, he's been causing some problems." "Yah, I have him in my English class and I find that he's going through some challenging times." So it's these fly-by-night comments that are how we sometimes learn about students. (first semi-structured interview)

The knowledge shared in these comments and conversations further the knowledge teachers have of their students, as they are able to receive advice and insight into how to deal with their student(s). They also gain further understandings of what a student(s) is like in another classroom.

The conversations teachers have with their colleagues allow for them to debrief, share, and reflect with each other. Spirit stated, "Without talking to each other, we let information slip away" (PIA). Conversations between colleagues are important because teachers can legitimize and validate their knowledge through dialogue. Dialogue creates shared understanding of the knowledge within their workplace. As teachers share information and ask questions of each other, they can reflect together and achieve validation and legitimization through comparison of knowledge with another teacher. Asking questions perpetuates teacher learning as it provides an

avenue for teachers to learn from the experiences of others and make changes to their pedagogical practices.

From my analysis, I noted that the participants consistently referred to trial and error learning processes in their descriptions of learning from their teaching practices. The trial and error learning processes were seen in their descriptions of teaching and experimentation with new activities, assessments, or materials. Michelle commented, “I think you do something and you kind of go, "Okay, what worked really well and what didn't work really well, and why?”” (first semi-structured interview). From this reflection, Michelle would make changes or improvements to the activities that did not work well and keep using the learning strategies that proved successful. Michelle would also use her observations and reflections to adapt behavioural strategies to best suit her students’ needs.

> I’m very much try it and see what happens. If it works, fantastic! If it doesn’t, then I change it again. One of our kids, when it came to timeouts it took about three, four, five different ways to figure out where timeout was going to be in this classroom, and *how* we were going to handle it, and the consistency for it to finally stick and work. (first semi-structured interview)

The experience of carrying out an activity or behavourial strategy presents opportunities for Michelle to reflect on her actions and student responses, and to learn how to adapt and improve her lessons and teaching. It is a continual process of experimenting, gaining feedback, and reflection.

When implementing new resources in her classroom, Spirit commented during an informal interview how students were essentially her “guinea pigs with the new resources”. She would take the feedback the students would provide on the worksheet, either through the

questions they asked, the comments they made about the questions, or from her assessment of their performance on the questions, and make changes to the worksheet for the next class or for the next semester. It also allowed her to troubleshoot with the students, as she would learn where they were having troubles with course content and then make the necessary changes to her lessons. When I asked Ashlee how she learned to do things differently in her lesson plans, Ashlee said, "Just trial and error. Some of it just didn't work and nobody learned anything" (first semi-structured interview). She provided an example of tweaking an anatomy worksheet based on student feedback. The students found researching and presenting on all of the body systems to be overwhelming, so she changed it to have them complete only one body system. The experience of carrying out an activity and implementing a new resource or behavioural strategy, provided opportunities for the participants to reflect on the process and learn from the experience. They were able to legitimize their teaching practice in terms of receiving validation on the resources or strategies that worked well and feedback to direct changes that would need to be made to the resources or strategies. The participants were also able to validate and legitimize their teaching practice through student feedback, as they would learn what worked or did not work for their students and why this was so. The experience of trial and error would lead to opportunities for the participants to validate and legitimize their knowledge.

Modeling is another way of learning from the experience of teaching. Throughout the data collection process, the participants were seen using modeling as a teaching strategy and when they turned to their colleagues for help. In the participants' classrooms, they would model or demonstrate to their students how to complete a certain task. Spirit showed her English students how to Google a Bible passage to assist in their comprehension of the passage and its' use. Ashlee demonstrated how to complete Google searches for the research project her CTS

students were completing. She guided them on how to choose an appropriate website and how to complete the worksheet with the information they found. In Willy's Art and Fashion Studies courses, she regularly demonstrated how to complete various artistic skills and techniques. When she showed her students how to thread a sewing machine and the techniques to use, it helped her students learn the skill more proficiently.

When Willy had to teach an English course for the first time, she approached other English teachers within her department for help. Knowing that these teachers had already taught the course, Willy asked these teachers for help because they had a knowledge base she was seeking. Willy stated:

> I have three really great colleagues that gave me lots of resources. Teaching me how I could teach it, always encouraging me, always telling me to take it easy on myself, it's going to work out, that one day they were in the same place as I was, and it's all going to be okay. They were fantastic. (first semi-structured interview)

The knowledge base of Willy's colleagues was built from their experiences of teaching English courses and in particular, their experience of teaching this course. The act of teaching is a way of knowing for teachers and generates a specific knowledge base of the curriculum and students.

When asked to describe her learning processes now in comparison to earlier in her career Spirit commented, "Oh I wish I was this wise when I started teaching [hearty laughter]… I think I deal with situations maybe a little bit better because of my experience" (first semi-structured interview). How Spirit approaches various situations in her classroom now is different from when she started because she has generated tacit knowledge from her teaching experiences. She knows what to do in these different situations because of the teaching experiences she has had.

From their experience of teaching, the teachers can then share the tacit knowledge they have gained.

The sharing of tacit knowledge continued within the English department when Willy helped Ashlee prepare to teach an English course for the first time. Willy remarked:

> I was lucky enough to have my 10-2 binder that came from a few different teachers the previous year, so I just gave her the binder and whatever questions she has, any resources she needs, I will either answer for her or find it somewhere else that wasn't in the binder. (second semi-structured interview)

Ashlee explained that after she received the resources from Willy, she sat down and re-typed the lessons, which included the notes she would give to her students and associated activities. When she had questions, she would e-mail or text Willy for clarification. In this manner, she was taking tacit knowledge from Willy and validating and legitimizing it through the questions and conversations with Willy. Legitimization also occurred when she personalized this knowledge base for herself and for the students in her classroom.

In trial and error learning processes there is an inherent component of making mistakes. The participants were observed making mistakes in their classroom and admitted these mistakes to their students. This usually occurred during lessons where students would point out inconsistent use of terminology or a facet of information, or identify errors found on worksheets. This was seen earlier with Ashlee and Spirit in their experimental process of implementing new resources. In their acknowledgement and correction of their mistakes during their lectures or on the worksheets, Ashlee, Spirit and the other participants learned and modeled this learning process to their students.

While teaching, teachers will make mistakes and have opportunities to learn from them. When reflecting on her experience of teaching English for the first time, Willy remarked:

> My colleagues said, "Here's my resources. Get through, learn." And at the time I would say, "I'm just trying to keep my head afloat. Like I don't even know what to do! I'm just losing my mind making sure I'm delivering the material properly and hopefully they're learning!" And they said, "Just *calm* down. Allow yourself to make the mistakes." (first semi-structured interview)

Her colleagues acknowledged that making mistakes were part of this learning process. They validated the normalcy of the process she went through and the feelings she had. They acknowledged that a part of learning how to teach a course came from the experience of using the resources she had been given, teaching the material to the students, and making mistakes.

Willy as a self-professed hands-on learner appreciated the Fashion workshops she attended because they presented her with opportunities to take the knowledge from a book(s) and experiment with it in a practical setting. As she attended these workshops with other teachers, she received feedback on her skills, gained different perspectives on how to complete a skill, and different ideas of how to present this skill set to students. She also learned that making mistakes is a part of learning these skills. Willy explained:

> Reading a book, it's so black and white. So at least when you're sitting in front of a person they can say, "They tell you to do the zipper this way but I've tried different ways and this other way works better." This is a good starting point but let's figure out different ways to do it… By being around someone else, they can encourage you, "Hey, make a mistake. It's okay! It can be fixed." It's the journey and the mistakes that make you better. (first semi-structured interview)

Willy gained confidence when her colleagues and instructors validated that making mistakes were a part of the learning process. As her and the other teachers worked together, they validated and legitimized their teaching practice; mistakes are a part of their professional practices and lead them to ways of knowing. Empathy, understanding, and support were also a part of these validation and legitimization processes.

Throughout the learning processes of trial and error, modeling, asking questions, sharing information or ideas, and problem solving, the participants were seen reflecting with colleagues through conversation and also on their own. Ashlee described this individual learning process during her first semi-structured interview:

> I learn best if I read it and write it, and then re-write it. So when I am making my plans and it's on something that I'm not entirely certain about or if I have decided to chuck something in—like we just got a whole bunch of material on Multiple Sclerosis, so I think I'm going to put that in next year when we talk about chronic diseases. I need to read it, I write it out and then I put it into my lesson plan but I write it out exactly the way I'm going to present it, and then I do the student part.

In this example and previous learning experiences described with Willy, Ashlee demonstrates the interplay between individual and social processes in teacher learning. She needs to individually learn the information first and then turn to her colleagues when she has questions or needs clarification on course content.

Individual learning processes were also seen when the participants would describe reflecting on the lessons they had taught, on the information they had gleaned from another teacher during a conversation, or when they received resources from another teacher and personalized them. Through reflection with their colleagues and self-reflection, the participants

juxtaposed current knowledge with past knowledge, which resulted in validation and legitimization of the knowledge constructed. The informal learning processes lead to knowledge construction for the participants through processes of documentation, validation, and legitimization. There was an interdependence of individual and social processes in teacher learning through their reflective and informal learning processes.

Short-term and long-term learning loops. From my analysis of the informal learning processes, I found that the participants exhibited short-term learning loops. These loops occurred in their knowledge practices when the participants had a problem and relied on their colleagues and knowledge objects to help them solve it. When the participants had questions pertaining to their teaching practice, or needed resources for a course they were teaching for the first time, they would turn to their colleagues within their PLC for help or to teachers in other forums such as online environments. Through processes of trial and error, modeling of teaching practices, and problem solving, teachers would gain knowledge. In her PIA, Michelle wrote about a recent learning experience she went through when she applied for an administrative position.

> The entire process was a learning experience. I have never had an interview like this before and I was very nervous going into it. The way I prepared for it was by speaking to our administration about what type of questions would be asked and I spoke to another teacher that had gone through a few of these interviews himself. Walking into an unknown situation, I had the interview and of course reflected on how I thought I did. Unfortunately, I did not get the position but was told to continue to apply in the future. The whole interview process was a learning experience, and I now feel that in the future I am that much more prepared in knowing what type of questions to expect and will be able to better prepare myself. A lot of learning also occurred through me being a part of

> the leadership cohort in the division. …I feel as a teacher and aspiring administrator that a lot of learning that occurs is after a new experience and through self-reflection and also speaking to others that have been through similar experiences.

Michelle's short-term learning loop involved a reliance on her colleagues. As she had never been through an interview of this sort before, she wanted various perspectives on this unknown situation before she went through it. She asked her administrators and another teacher to share their interview experiences and knowledge with her and she pulled knowledge from the leadership cohort she had participated in. She then had the experience of going through the interview and reflecting on it afterwards to decide what she would do differently. Michelle will use the knowledge she has gained from this experience when she applies and interviews for a future administrative position.

Spirit illustrated a short-term learning loop when she accessed English teaching resources from the TES website. Since Spirit is new to teaching her English courses, she does not have a lot of resources and is also in need of more current resources that incorporate technology. As such, the TES website is a valuable knowledge object in her learning. In my conversations with Spirit, she had mentioned quite a few times about this website and her excitement with it. When speaking of this website during our introductory meeting, she described the website as being like "crack cocaine" and a "time-stealer" because she is enamoured with having access to such a multitude of resources at her fingertips. This is in direct contrast to when she first started teaching, as at that time, teachers had to create all of their resources on their own. "I had to develop everything. There was nothing there. I walked into empty classrooms with behaviour-disordered junior high kids. Now, I can go on the Internet and I can find exams, and I don't have to make it all myself" (first semi-structured interview). Having all of these resources and

teachers available to her on this website can be addictive for her where she has spent a lot of time going through the resources. As a result, she has limited herself to one morning a week in which she will "steal" resources (introductory meeting field notes). She does not post resources herself to this website because she is not ready to share her resources with others yet since she feels she is still new in her learning.

Spirit's short-term learning loop starts with a need for resources, in which she will turn to this online community to find these resources and speak to other teachers over e-mail if she has questions. Spirit will then trial the resource in her classroom and make changes to it based on her experience of using it and student feedback. For Spirit, her reliance on colleagues is seen in a different manner, as she turns to teachers in an online community for resources as opposed to her colleagues in her English department. This online community is important to her daily teaching and knowledge practices.

Ashlee and Willy both described short-term learning loops in their attainment of resources for the English courses they would be teaching. Willy is in her second year of teaching her English courses and for Ashlee, this was her first time. Ashlee described herself as being the "needy one" (journal entry) in the department because of this and turned to Willy for help. In her journal entry, Ashlee wrote:

> The struggles I had [with the English course] revolved around having trouble figuring out timeframes and what could be accomplished in a block. As well, I needed to learn how the senior high curriculum was organized. I had A LOT of help from colleagues, especially Willy. I texted her throughout the summer and she sat down with me many times.

Ashlee needed help attaining resources for the new course and in figuring out how to plan her units. Ashlee's short-term learning loop involved Willy and her binders of resources. Willy provided Ashlee with her resources, where she gave her binders of resource material and Ashlee would pick the materials she wanted. She would approach Willy with questions, problem solve with her and obtain the necessary knowledge required for her teaching practices.

Willy went through a similar short-term learning loop when she first taught her English course. During a formal interview, I asked her how she approached learning the material for her English courses and she told me she had colleagues to rely upon. "I have a very supportive English Department who are always willing to share stories and resources. They have the student's best interests at heart and know that by supporting/mentoring me, the students are the ones who will benefit the most" (journal entry). Willy turned to her colleagues for help because she needed resources for her new course and knowledge on how to best approach her lessons. Her colleagues shared their resources with her, showed her various ways she could teach the course, and encouraged and supported her. Having taught the course a few times now and having a better understanding of the course content and student expectations, Willy reciprocated and modeled this support to Ashlee. The binders of resources were a documentation of knowledge for the subject area and a way for Willy and Ashlee to validate and legitimize the curricular knowledge they would need. This knowledge object was synonymous to the website Spirit used because they both allowed the teachers the necessary means of obtaining and giving documented knowledge, and the opportunity to validate and legitimize knowledge.

Long-term learning loops were also seen in the knowledge practices of the participants. Each of them described incidences of keeping up with advancements in their teaching areas when they attended a workshop or PD session, and referred to various ways of caring for their

long-term career interests. Michelle had earned her Master's degree, and participated in a leadership cohort to learn more about leadership expectations and responsibilities within the school district. Michelle described her experience, "I feel I learned from the leadership cohort. I have learned a *lot* this year. And you *think* you know it all, but you *really* don't" (first semi-structured interview). The leadership cohort provided her with different perspectives on leadership, which cannot be obtained exclusively through teaching or from being a staff member.

Spirit and the other participants were observed participating in technology focused PLC sessions, since a main focus of the school district was integrating technology to support the development of students as digital learners. Spirit furthered her learning of technology when she attended district Google Doc sessions during the summer, and experimented with this technology in her classroom. Spirit also had earned her Master's degree and tries to attend English conferences that are held annually. Michelle and Spirit both cared for their long-term career interests and advancements in their field through attainment of a higher degree, Michelle's cohort experience, and Spirit's participation in English conferences.

In order to get a better understanding of the knowledge content for her CTS courses, Ashlee similarly attends conferences. From the nursing conferences Ashlee has been to, she has received valuable information that has supported her instruction. Willy spoke of attending several Fashion Studies workshops to obtain knowledge for her courses. As opposed to relying solely on textbooks, she preferred the opportunity to practice these techniques amongst colleagues and in the presence of an instructor(s). "I go to courses now where it's hands-on and you get to learn it that way; you get to bring the material from books alive" (first semi-structured interview). This knowledge attainment for both Willy and Ashlee cares for their long-term career

interest as they build up the knowledge base they need to teach their courses and are also able to keep up with advancements in their teaching areas.

Other Members of the Knowledge Culture

From my analysis of the observations and interviews with the participants, I identified other members of their knowledge culture that were not initially included in my conceptualizations. Students were an integral part of teacher learning, as they directly influenced teaching practice and learning, and need to be included as a part of the knowledge culture. As well, colleagues need to be expanded to include EAs, online communities of teachers, and administrators since they were also a part of the learning and knowledge construction processes for teachers.

Students' role in the knowledge culture. During classroom observations, I found students impacted teaching practice through the questions they asked. Students were seen many times asking questions of the participants during lessons. These questions were mostly relevant to the lesson or activity at hand. The relevant questions asked of the participants provided them with an indication that either further instruction was required or clarification was needed on an assignment or lecture point. Ashlee explained, from the questions students ask, "I realize that I'm not as clear as I think I am sometimes, so I do change things. I realize, "You know what? They didn't get as much as what I thought they did", so I have to go back and do some different things" (second semi-structured interview). This was seen when Ashlee's medical studies class was working on a worksheet and had questions about it. She realized they needed an example of an appropriate website for their research and how to fill in the sheet. Student questions provided Ashlee and the other participants with knowledge on student progress, in terms of their comprehension, engagement, and needs.

Student questions are a way of knowing for teachers. They are an avenue for teachers to explain rationale for what they are doing in their lesson and why, and for them to enter into critical discourse with their students on either course material or on a teaching strategy. This creates an opportunity for teachers to legitimize their teaching practice and knowledge. It is a construal process in which teachers can know what is right in their pedagogical practice. When students ask questions, teachers can clarify their expectations for students and receive indirect feedback on their lessons and instruction. This feedback allows them to receive validation for the knowledge they are providing to students. Students are also able to validate and legitimize their knowledge because asking questions provides them with the opportunity to clarify what they have learned with their teacher and obtain feedback on their understandings. Student-teacher relationships can also include a reciprocal learning relationship and are an important component of teacher knowledge construction processes.

An important aspect of teacher knowledge construction is through the reciprocal learning relationship, teachers are provided with an avenue to gain knowledge about students that does not come from books or pedagogical theory. As teachers develop a relationship with their students and get to know them, they are able to plan lessons that are more aligned to their learning needs. Willy explained, "I understand that I have material that I have to deliver to the students. It's curriculum. It has to be done. But it totally depends on the dynamics of my kids how I'm delivering it, in what way I deliver it, in what medium I'm going to deliver it, what kind of passion I'm going to put behind it" (second semi-structured interview). Getting to know her students' learning needs and personalities is a vital part of Willy's pedagogical practice; from this knowledge she determines what teaching practices to implement.

In an informal conversation with Michelle, she mentioned that she does not have a formalized curriculum to follow like they do in core courses. I asked her how she goes about putting together programs for each student, and she told me she analyzes the skills (academic, social, motor, cognitive) they have and then measures this against the skills they will need to develop to be functioning members of our society. Michelle explained she relies more on testing to determine their reading, comprehension, math, and science knowledge levels. She then selects relevant resources from various sources such as books and units from the other special needs program in the school, online resources, education stores, or other teachers. "There are special needs resources out there and I have one academic one and one social skills one and they're pre-made plans and worksheets and lessons and how to go through them with kids" (second semi-structured interview). Using her professional knowledge base, analyses, and student observations from her EAs, Michelle selects content and activities that are best suited to her students' learning needs and adapts them appropriately. Her planning process is continual and evolves with her students' progress.

From the experience of teaching and working with students, some of the participants identified inconsistencies between theory they had learned and the realities of a learning environment. Ashlee commented, "I sometimes would rely too much on what the "experts" or the books would say… Children are unique and one style doesn't fit all. And if we truly want to make a difference we need to step out of our comfort zone and figure out what works" (PIA). Michelle had a similar experience when dealing with behaviours in her classroom. She described a learning experience with her students as follows:

> Classroom management is probably the one. They teach you in university that this is how you should manage a classroom and when there are behaviours, this is how you should

> deal with it. But sometimes it doesn't work! It doesn't! When I worked at another school, all that went out the window and it's getting to know your students! Getting to know them and what works is the biggest thing whether it's learning or how they learn. (second semi-structured interview)

Michelle and Ashlee both had a clash between what should happen based on what they learned theoretically and what actually happened and what worked. For Michelle and Ashlee, the theory they learned in university and from books did not address the relational side of the learning environment and how much influence this would have on their teaching practice. From the experience of teaching, trial-and-error, and their professional knowledge and analyses of their students, Willy, Ashlee, and Michelle learned that getting to know their students was the best way to deal with behaviours and adapt activities and resources to meet learning needs.

For teachers, their knowledge is not just curricular or theory based; it also includes information about students, their actions, and their learning needs. Teacher-student relationships and the experience of teaching lessons to these students allow teachers opportunities to construct knowledge about their students and make necessary changes to their lessons and teaching practice. Students are a part of the informal learning processes for teachers. Michelle stated, "I constantly learn everyday about my students and from my students" (journal entry). Through trial-and-error in lessons, modeling of behavioural expectations and learning, and asking questions, students impact teacher learning. Students are an important part of the legitimization and validation processes teachers go through within their knowledge culture.

The 'other' colleagues in the knowledge culture. Colleagues are a part of the knowledge culture for teachers. In my conceptual framework, I had presumed that teachers would be the main faction of colleagues in which teachers would learn from. This did not always

prove true in my data collection and from my analysis, I identified that EAs, administrators, and online communities of teachers were also prevalent colleagues for some of the participants, as they were an important part of their informal learning. Each of the participants worked in some capacity with an EA(s), however the working relationships were not all the same. For Michelle in particular, her EAs were important to her knowledge construction processes.

In our introductory meeting, Michelle described herself as a "lone island" because she did not have other teachers to work with in her program; her PLC comprised of herself, an administrator, and her EAs. Despite not having other teachers to directly work with, Michelle collaborated with her EAs, viewed them as an imperative part of her program, and utilized their knowledge readily. "I don't hide anything from them [EAs], and I work very closely with them and they are fully aware of what my expectations are and what the students' expectations are… We work as a team and I think that's what works really, really well" (second semi-structured interview). Although she still made the final decisions on programming and lesson plans, the information she received from her EAs informed her practice. She also readily shared knowledge with them, both at their PLC meetings and throughout the day. Michelle also relied upon an administrator for help and advice with program planning, as she would gain insight and perspectives on issues that arose in her program. Michelle explained, "I think that's the best way, just firing ideas back and forth with people. I've done that many times with our VP here, where we've talked about our program" (first semi-structured interview). As Michelle shares information and brainstorms solutions to problems in her program, she is validating and legitimizing her knowledge with her EAs and administrator. Michelle's informal learning allows her to obtain necessary knowledge to better plan programs for her students.

The online community of teachers on the TES website was an inspiration for Spirit and as established earlier, she used resources from this site quite regularly. She commented, "There's an online community of teachers that are willing to share their expertise and knowledge!" (first semi-structured interview). Teachers in an online community have the potential to influence teaching practice and learning for each other. As they upload resources for other teachers to use, they are sharing a documentation of knowledge. When teachers comment online about the resource, the teacher receives validation and legitimization of their knowledge. Spirit has e-mailed other teachers on this website and had conversations about the resources she has used. This virtual relationship with another teacher is different from the relationships she has with teachers in her PLC, because she has never met the other teacher. However, this virtual relationship is an important part of her knowledge culture, as she is still able to validate and legitimize her knowledge through these relationships and from the knowledge objects.

Summary

The key points that emerged from my analysis of the participants' individual experiences, as described in the interviews and classroom observations, were as follows. Each of the teachers learned through informal means in their workplace and each participant constructed knowledge with their colleagues and demonstrated individual aspects of reflection and learning. The informal learning processes of trial and error, asking questions, sharing information, modeling teaching practices, problem solving, and reflecting were embedded within the participants' knowledge culture. Michelle stated, "Educators are teachers and learners concurrently" (journal entry). This proved true for all participants. Through their informal learning, each participant had short- and long-term learning loops, where they turned to colleagues to help them through a new experience, such as teaching a course for the first time, and furthering their attainment of

professional knowledge through attendance in a workshop or master's degree program. All of the informal learning processes within the knowledge culture involved the inquiry processes of documenting, validating, and legitimizing knowledge. In each of these processes, teachers and other members of the knowledge culture, such as EAs, students, administrators, and online teachers, played pivotal roles in co-constructing knowledge with the participants.

In this chapter, I described how the participants understood their informal learning and the impact this had on their teaching practice. I detailed the individual and social processes in the participants' workplace learning, and discussed the impact of knowledge objects, professional relationships, and practices on the participants' learning. Knowledge construction for each teacher within this knowledge culture involved working with others, such as students or other teachers, EAs, and administrators, and technology or other objects in some regard. In the next chapter, the participants' PD and PLC experiences and their associated co-construction of knowledge will be described, along with a discussion of the importance of relationships to teacher knowledge practices, the interdependence between formal and informal learning, and further reflections on the individual and social processes in teacher learning.

Chapter 5 – PLC and PD Learning Experiences

This chapter will further employ the interpretive inquiry approach described in chapter three and will address the part-whole relationships through an examination of the participants' informal learning processes that occurred in their PLC meetings and PD days. From observations of the participants working with other teachers, informal interviews with the participants, the second semi-structured interview, and focus group, I will examine and describe how the participants experienced informal learning within their PLC and during PD days. This will allow me to provide further understandings on the social processes in teacher learning and detail the impact of professional relationships and practices on teacher learning. From the analysis of these collaborative contexts, I will provide further detail on how the participants documented, legitimized, and validated knowledge with their colleagues and through knowledge objects, and the mechanisms that facilitate the co-construction of knowledge between teachers. These understandings again incorporate more of a focused perspective on the research questions and sub-questions because they are derived from my observations and conversations with the participants during these learning experiences and afterwards in an interview.

In this chapter, I will begin with a description of the context of the PD days and PLC meetings and then move from a part to whole reflection in discussing the common themes, informal learning processes and relationships and trust within the knowledge culture, as they pertain to the observed collaborative learning experiences of the participants and to the participants' descriptions of these experiences in the interviews. I continue to focus on the particulars of the data collected that questioned, surprised, or prompted me to reflect upon the research question and sub-questions in new ways, and on the language used by the participants and their utterances as exemplars to support the interpretations made and to convey meaning. I

will conclude this chapter with a synthesis of the interdependence between the individual and the social in the informal learning processes of the participants and the impact this has on their co-construction of knowledge.

Learning Experiences

When data collection began in May, the school provided PLC time to teachers on early dismissal days. This occurred on the second Wednesday of the month where, after students were dismissed for the day, teachers would convene in their PLC for an hour and then proceed to a staff meeting. However, this changed in September as the school switched to providing PD time on Fridays. One Friday a month the teachers would be provided with PLC time or PD opportunities in the morning and early afternoon, and then end the day with a staff meeting. This was done to streamline PD and provide teachers with more time in their PLCs. The teachers within this school have limited input into the PD day activities or speakers planned at their school or at the district level. In the first part of this chapter, I will describe the activities the participants engaged in during their PLC times and on PD days based on my observations and field notes.

PD Days

The first PD day I observed occurred in September and consisted of teachers from all across the district attending literacy sessions at one of the high schools. There were about twenty different sessions for the teachers to choose from and experts were brought in from both outside and within the district. The teachers attended the sessions of their choosing in the morning and then met with their PLCs in the afternoon. In the first part of the morning, I went with Ashlee to a presentation titled, *Best Practices in Literacy*: *Reading for Secondary Levels*. This session occurred in a classroom and teachers were seated in the student desks. The presenter was from

outside the district and went through a series of presentation techniques such as having the teachers share relevant reading experiences, small group activities, lecturing to the teachers using PowerPoint, and providing many ideas to the teachers for implementation into their courses to help improve student reading. When teachers were working together in their small groups, they shared previous experiences or stories that were related to the activity at hand. These experiences or stories were from their classroom experiences with students and some were from their own personal learning experiences as a student. During this session, Ashlee actively participated in the activities the presenter asked us to complete and she shared little anecdotes from her teaching experience with her group.

For the second half of the morning, I joined Willy in the library for the digital literacy session. The teachers were scattered throughout the area with their laptops open. Some teachers were gathered together at tables and others were sitting in carrels. The instructor was at the front of the room, where he was demonstrating Google Apps to the teachers. He was working on his own laptop that was connected to a projector so teachers could follow along. The session was a combination of the instructor showing the teachers how to do something and then giving the teachers time to try it on their own, where he would be walking around and providing assistance as needed.

This session was a bit more animated in terms of talking, as teachers would talk and help each other as the instructor was showing them or after he gave them time to work on their own. Some of the teachers were working quite independently while others preferred to ask more questions and worked closely with the other teachers around them. Some questions I overheard were: “Am I doing this right?”, “Is this right?”, “Is this what yours looks like?”, “How do I do that?” (field notes). Throughout this session, Willy was sitting in a carrel and was working more

independently. She would look back and forth between her screen and the main screen, and would ask the few teachers around her for help when she needed. She would also ask questions of the presenter when he walked by, such as "Am I doing this right?" or for help when she was confused on how to complete a step (field notes). I also observed Willy helping others around her when they were in need. She seemed quite proficient in using technology and grasping the Google Apps.

October PD day. This PD day was sequenced with providing PLC time in the morning along with the staff meeting, and then in the afternoon, teachers would be working on student IPPs together in the library. During the IPP Party, I sat with Ashlee and Willy as Michelle was a Party Helper assisting other teachers and Spirit was not at the IPP Party because she does not attend every PD day since she works part-time. Administration had named this work session as the IPP Party and this year was the first time the teachers were working on the IPPs during the day; in previous years, this occurred during an evening session.

The teachers in the school all have laptops as opposed to desktop computers. As such, each of them had their laptops up and running, with *PowerTeacher* open. In this software program, they would be writing their IPPs. A consultant from the district, Albert, led the IPP party. A long yellow sheet was handed out to all the teachers. This sheet summarized the IPP writing process and what needed to be included. There were rules, tips, and expectations for what should be in an IPP, and it had a step-by-step procedure on how to write the IPP, with examples provided. After a brief overview of the procedure and expectations, the teachers began working.

Throughout the party, the Party Helpers moved around the room and answered the questions teachers had. They helped teachers phrase their goals and problem solve when they did not know how to do something. Some teachers moved around the room to speak to the teacher

who had previously written an IPP for a particular student. They would discuss the student and then from that conversation, move back to their computer and input information for this year's IPP. Ashlee worked closely with the teacher she team-teaches one class with. She would ask her questions, tell her what she was putting in for particular students, and she would verbally agree with suggestions that the teacher made. They talked about some of their students in more detail and came to a consensus of what they would include in the IPP. Willy tended to work more individually but would ask questions of Ashlee when they arose. Michelle walked around and helped answer questions. I saw her approach teachers and check in with how they were doing and asked if they needed any help. If they did, she sat down beside them and helped them. As the afternoon progressed, teachers began to work more individually, with not as many questions being asked.

PLC Meetings

There were two PLCs that I observed throughout my data collection: Michelle's PLC and the English PLC, which Ashlee, Willy, and Spirit were a part of. Michelle's PLC mostly consisted of her and her EAs. At times, administrators or teachers from the other special needs program in the school would join them. For the morning I observed her PLC, Michelle was joined by two of her EAs and one vice-principal. We sat around a table in the kitchen area of their program rooms and this PLC ran more like a meeting where Michelle shared information and the EAs and/or vice-principal would comment or share their ideas and perspectives. She had an agenda and would move through it accordingly. The information Michelle shared was in regards to past discussions she had with the teacher in the other special needs program, and they were using this information to help them make decisions about the field trips they were wanting to plan and the logistics of organizing busses. Conversation ensued around the information,

where ideas and thoughts were discussed and more ideas were bounced around. It was decided that more information was needed, and Michelle and the vice-principal made notes of what they needed to do. Michelle was very relaxed leading the PLC. It was evident everyone respected each other and they enjoyed working together.

English PLC. In my observations of the English PLC, I observed them continuing their learning of a new software program that had been implemented in the previous year, *PowerTeacher*, and working collaboratively on common exams. Both PLC meetings occurred in a classroom with the teachers scattered throughout the room, sitting in student desks and facing the Promethean board at the front, which had the agenda projected.

In September's PLC meeting, even though the teachers were familiar with parts of *PowerTeacher*, they wanted to learn more about how to set up and use the *Gradebook* component. On the whiteboards at the front, there was a vast amount of writing on them depicting a variety of different ways to input formative and summative assessments. An English teacher, Sheldon, who others considered to be an expert with this program, was leading the PLC. Throughout the meeting, he would demonstrate how to do something and the teachers would follow along, completing the steps on their laptops. They would ask questions as they needed and either Sheldon or another teacher would provide the necessary assistance. There was also much discussion around descriptors and weightings. Willy helped Ashlee and many of the other teachers who needed assistance, as she was quite proficient with the program. She also participated more in the discussions since she had taught the courses previously. Ashlee and Spirit required a bit more assistance with the software program, and remained quieter and conceded with the group decisions or Sheldon's suggestions. This PLC time was a positive

experience for these teachers, as teachers commented, “We need to do this more often! It was really good!” (field notes).

In November’s PLC meeting, the English teachers met in the morning and were provided with most of the Friday to work collaboratively on common exams. Ashlee and Willy were both present during this session, but Spirit was attending a first aid course outside of the school. Throughout this meeting, there was a lot of discussion that occurred. The teachers had to make decisions about which novels and plays best fit each course and then compile these into a list for the teachers of those courses. They also had to work on creating common exams, in which they discussed the questions that were best suited for a particular exam in terms of which questions would be kept, edited, added, or deleted. The discussions entailed the teachers sharing their previous teaching experiences and current teaching practices, asking questions, and making collective decisions. The collective decisions they made in regards to the exam questions allowed them to create common unit and final exams that would be used in each section of a course. They were just starting this process and would continue it throughout the school year.

During the exam revision process, Ashlee tended to listen more to the conversation around her, taking in what her colleagues were saying. She did express appreciation to her colleagues for the support they had, and were, giving her in terms of the resources and ideas she was receiving. Willy, on the other hand, was helping her colleagues. She was an active participant in the discussions, providing suggestions, asking questions, and taking to heart the knowledge and ideas other teachers were sharing. She expressed her appreciation for their suggestions and ideas on how to prepare her grade ten students for their final exam.

Themes Emerging from the Research

In this section, I present and discuss the themes, informal learning processes and the importance of relationships and trust to the knowledge culture, as they pertain to the participants' social learning processes that were observed in the PD days and PLC meetings, and described in the second semi-structured interview and informal interviews. I focus on the language used by the participants and their utterances as exemplars to support the interpretations and to convey meaning. The findings presented in this section provide insight into research question and sub-questions in terms of how the participants experienced informal learning in their PLCs and during PD days, the impact of these experiences, professional relationships, and practices on their learning, and the mechanisms that facilitate the co-construction of knowledge between themselves and their colleagues.

Informal Learning Processes

From my analysis of the text as a whole, I noted that nearly all of the informal learning processes identified and described in the participants' individual learning experiences, as seen in chapter four, were at play during the PD days and PLC meetings. I observed the participants working individually and collaboratively with others, actively listening and participating, reflecting on the information they were learning or discussing, asking questions of the other teachers or presenters, experimenting and learning about new software, and discussing their pedagogical practices. These observed processes provided opportunities for the teachers to validate and legitimize knowledge through conversation. Having the time to meet and work together during these structured times was fruitful for the participants, as they not only had time to reconnect with other teachers and friends, but to also converse about professional practices and engage in conversations relevant to their daily teaching methodology and activities. Teachers

were provided time for informal learning within the formalized structure of the PLCs and the PD days.

In all of the observed PLCs, the teachers were able to share their practice collectively and reflect on it, providing them with an avenue for validating and legitimizing their knowledge. Michelle ensured her EAs were apprised on the previous conversations she had with other administrators and teachers, and that they were brought up-to-date with past agenda items. Michelle also brainstormed with her EAs to solve the logistics of bussing and reflected on aspects of their programming to better improve the work experience options they provided to their students. She greatly valued their input and the suggestions they provided. Through this collaborative process of sharing, brainstorming, reflecting, and obtaining feedback, Michelle validated and legitimized her knowledge to guide the resolution of the bussing situation and to help plan work experience programs for their students. In this manner, she co-constructed knowledge with her EAs and administrator.

While setting up *Gradebook* and creating common exams, the English teachers considered their teaching practices in comparison to their colleagues, and were able to get ideas from each other on how to better align assignments with provincial achievement expectations and for places to find images for expository writing. In this regard, the teachers were talking about their pedagogical practices and co-constructing knowledge together. These collaborative PLC sessions provided an opportunity to the teachers to come to a consensus on their assessment practices for the English department. The teachers asked questions of each other, comparing and contrasting their assessment and teaching practices, and then reflected on their own teaching practice in relation to these comparisons. Spirit explained, “It's really good to confirm because even though we all have the same objectives, we all approach it in a different way” (second

semi-structured interview). The English teachers were able to share new ideas for achieving learning outcomes for their students and established a commonality to their unit exams. Through reflection and a comparison of the different ways they approach assessment, the teachers were able to validate and legitimize the knowledge needed for their teaching practices.

In all of the sessions observed, teachers asked each other questions of varying nature such as, “Am I doing this right?” “How did you do this?” “How do you assess this?” “How do you cover this topic?” (field notes). These questions allowed the teachers to compare the work they had done to another teacher’s, to receive validation that they were on the right track or that what they were doing in their classroom was similar to what another teacher was doing in theirs, to gain clarification if they were having trouble, and for them to all legitimize their knowledge as a result of the conversation that would come about from answering these questions and reflecting together. Questions were an inherent part of the trial and error processes observed during the Digital Literacy session and the *Gradebook* PLC, and an important mechanism in how the teachers co-constructed knowledge.

Mentoring. During the IPP Party, Michelle exhibited another informal learning process. She was a Party Helper and had been asked the previous year to help teachers out during the evening session. It was assumed that she would be willing to help out again this year. Michelle did not have a say into how the afternoon would be organized, but she was happy to help out as needed. During the second semi-structured interview, I asked Michelle to describe her experience of being a Party Helper:

> A lot of staff within this building know that's what I do, so I think it wasn't hard for them to ask me questions. A lot of them would ask this time around versus, I feel, the first time. As I walked around, it was almost like I'd look over people's shoulders and then

> they'd ask, [in a soft, tentative voice] “Is that a good goal?” And I'm like, “Yah. No, that's fine.” Or, “Oh, actually, this is what it should be.” And they're like, “Okay!” And then sometimes they’d say, “Okay, this is what the student needs help with. How can I write a goal?” I would then help them with that.

Michelle appreciated the time to be with other teachers and to share her expertise with them in this mentoring and leadership role. Michelle received validation for the knowledge base she had and was legitimized in her professional practice. In answering the questions the teachers posed to her, Michelle was also able to validate knowledge for these teachers and legitimize their writing process. Michelle was able to actively participate in professional conversations and help teachers problem solve as they were trying to set goals and outcomes for their students.

The role of technology in informal learning. From my analysis, I found that technology was the main knowledge object used regularly in the participants’ knowledge culture. The technology used in the PD and PLC sessions provided opportunities for the leaders of the session and the teachers to document knowledge. In almost every session, PowerPoint’s were used to present knowledge to teachers. When teachers were given time to talk about the information presented on the slides, they were able to legitimize this knowledge. For example, during the Reading session, Ashlee and the teachers around her would talk about the information presented to them and legitimize it through comparisons to their teaching practice and experiences with students and the curricular material. The Promethean and whiteboards also displayed knowledge during the English PLCs. When the teachers reached consensus on the descriptions and weightings of course material, and the novels and plays to be covered in each grade, they documented this legitimized knowledge in word documents, e-mails, or their grade book’s. In the Digital Literacy session and the *Gradebook* PLC, computers and projectors were used to model

how to complete a skill set. Through the technology, the instructor and Sheldon showcased how to set-up a Google doc and parts of *Gradebook*. The teachers would then complete what had been demonstrated on their own computers. During this process, teachers would ask questions and receive suggestions or feedback if they were having troubles. This process of trial and error allowed teachers opportunities to document and legitimize the knowledge they were learning, and co-construct knowledge through these mechanisms.

One of the assumptions I had when I went to observe the PLCs and PD days was that there would be lots of discussion during teacher collaboration. For the most part, this was predominantly true, as seen in the descriptions provided in chapter four and in the PLCs and some of the PD sessions. However, this did not occur all that much during the IPP party. I found that most of the teachers completed their IPPs individually and only once in awhile, did I see teachers walking around to converse with other teachers. Even with Willy, Ashlee, and the teacher Ashlee team-teaches with, they asked questions more at the beginning of the process and then less and less as the afternoon progressed. Most of the conversation was directed towards the Party Helpers when teachers had questions about the program or how to write a goal. Michelle explained to me that although the teachers might not have been talking to each other in person, they were communicating with each other through *PowerTeacher:*

> I think the reason why there wasn't as much chatter is because it's live as people are going through those IPPs, and they're saving and they see the initials and they're going, “Oh, I have this behaviour.” They'd then be like, “Oh, Mr. Brown already made that,” and “Oh, yah, I agree with that. I'll just put my initials beside it.” (second semi-structured interview)

In the findings thus far, conversing with teachers is a very important part of their informal learning processes. My analysis of the IPP Party demonstrated another form of conversation that occurred for teachers where they were conversing through technology. Even though the teachers were not communicating verbally with each other, they were able to communicate through the software program and see the goals other teachers were writing or acknowledging for students they had in common. The teachers were validating and legitimizing the professional judgements they were making on each of the goals through the computer program.

Impact of informal learning on teaching practice. In both of my observations of the English PLCs, the teachers were actively engaged. All of the teachers were participating in conversation, in making decisions, and in setting up their marks program on their laptops. At the end of the *Gradebook* session, they shared their positive experience with exclamations of, "We need to do this more often! It was really good!" (field notes). For some of the participants, they appreciated the time to work together and the collaboration that occurred in these PLC meetings had a direct impact on their teaching practice, in terms of providing opportunities to learn about assessment in new ways and developing shared assessment practices. In follow-up interviews with Ashlee and Willy, they both expressed the positive impact that the collaborative work they completed in the PLCs had on their teaching practice.

Ashlee appreciated the opportunity to work with her fellow English teachers, as the work they completed in their PLC directly influenced her teaching practice. Following the *Gradebook* session, she commented:

> I had pretty much finished setting my marks book up while I sat there, and that helps because then you can get help while you're sitting there and then you go back and it's

> done. It's nice to be able to leave with something finished and totally done. (second semi-structured interview)

Ashlee participated in the PLCs as an active listener in professional discussions and obtained directives on how to approach and implement her assessment practices. Ashlee found these sessions valuable because it was a learning need she had in teaching this English course for the first time and it allowed her to gain knowledge on assessment from other teachers' experiences. "It was very good, very productive. I was really, really happy that our lead teacher let us do that… I actually *really* enjoyed that one. I got more out of it than I've gotten at other ones" (second semi-structured interview).

Willy took on more of a mentor role during the *Gradebook* session, as I observed her helping many of the other teachers when they were having difficulties or had questions. When asked about her experience, she explained:

> Even though I knew everything that they were talking about, it doesn't matter because my colleagues didn't. That's why we were there, to make sure that they knew what was going on. It was helping a colleague do better. (second semi-structured interview)

I observed Willy answering questions and showing others how to do various functions in the software program. Willy was more animated and engaged in the PLC sessions then during the PD day literacy session and the IPP Party, as she wanted to ensure her colleagues were able to receive the help they needed. Even though it did not directly meet a learning need she had, she still found it to be a valuable experience as she was able to share her knowledge and experiences with this software program, validating and legitimizing this knowledge base for her and her colleagues. She was an active participant in the collaborative process of developing shared assessment practices. In her journal entry, Willy stated, "This was one of the most fulfilling PD

that I have ever been a part of." This is a direct reflection of the PLC session having relevance to her current pedagogical practice.

Short-term learning loops. From my analysis of the informal learning processes observed during the PD days and PLC meetings, I found that the participants once again exhibited short-term learning loops. These loops occurred as the participants were learning about literacy, *Gradebook*, and working on final exams. In these respective sessions, the participants relied upon their colleagues and knowledge objects for experimental practice. Through processes of trial and error, reflection, and problem solving, the participants gained knowledge.

Michelle and Ashlee both attended the Reading literacy session on the first PD day. Literacy was a district initiative and they each wanted to gain information that would be relevant to their classes. Michelle was looking for new ideas to teach a novel unit to her students and to receive feedback and validation of her current pedagogy. She explained, "I talked with the presenter afterwards, saying, "This is what I'm doing. Is that good? Could I be doing more with them?" (second semi-structured interview). When Michelle approached the presenter, she shared her teaching pedagogy with an expert and through her descriptions and questions received feedback on what to improve and what to keep the same. From this conversation, she was inspired to implement an idea from the session. "I started doing the chapter summaries. We have that big sheet in front of our class, the flip chart sheet. So what I decided to do, which I never did in the past, is after every chapter, I'd stop and ask them, "Okay, what did we just read about? What happened in this one?" And then I'd write their answers on there" (second semi-structured interview). Michelle's short-term learning loop involved seeking advice and knowledge from the presenter and then experimenting with the new ideas in her classroom. Following the session, she took the time to reflect on her program and the feedback she had received and incorporated a

new teaching strategy. This trial and error process allowed her to further her learning on literacy and to implement a strategy that better met her students' literacy needs. Michelle said, "I really liked this session, as I got a lot out of it" (second semi-structured interview). The ideas from this PD session impacted and progressed her teaching pedagogy.

For Ashlee, she was hoping to gain ideas for helping her students with their reading skills because this was her first time teaching an English course. However, she had a different learning experience than Michelle when she employed the ideas she had gained from this session. When I asked her if she had used any of the reading strategies from the session in her classroom, she explained:

> I tried doing some of those. It doesn't always work, though, especially with that group [her English 20-2 class]. You say everything has to be in pen and they show up with a pencil. I haven't *used* a lot. I had big plans too. Oh! I did do how to write a paragraph on a paragraph and that came from that session. I can't remember how it came out of that session but I know that's where it came from, the idea. (second semi-structured interview)

When I asked her if the lesson and teaching strategy had gone well, Ashlee exclaimed, "No! No, it did not. It was very hard. [laughter] We planned it but they had a rough time with that one" (second semi-structured interview). As Ashlee reflected on the lesson, she realized that it might have been too early in the year to implement it because they had not yet adjusted to the expectations of this course and the assignment. "They were still bringing in a lot of stuff, I noticed, from last year's course, which is fine. Good ideas but it just didn't go with what we had done" (second semi-structured interview). She had plans already in place to change the strategy for next semester and a better idea on how to approach this lesson with next semester's class. In her short-term learning loop, Ashlee went through a trial-and-error process where she

implemented a new teaching strategy and reflected on what worked and what did not work, and made changes to the lesson for next semester. Her learning experience was different than Michelle's but it still impacted her teaching practice. The unsuccessful implementation of the new strategy generated a lot of reflection and re-evaluation for Ashlee and this will impact how she teaches the course the next time.

In the English PLC, the teachers were learning about *Gradebook* and creating common exams together. In the *Gradebook* PLC, Sheldon led the English teachers through the software program step-by-step and as they progressed, they would discuss as a group how their grade-books would be set-up and how the assessment objectives would be stated. In this process, the teachers were problem solving together, as they would ask each other questions if they needed help with the program or discuss various ways to phrase assessment outcomes. At the end of this session, the teachers left with their grade-books completed, which gave them great satisfaction as indicated in Ashlee's description on the impact it had on her teaching practice. In this short-term learning loop, they used the knowledge objects of their laptops, the software program, and a projector to collectively learn about *Gradebook* and set it up for their individual classes. They also relied upon each other to solve the problems they came across and to make collective decisions. Their processes of asking questions, problem solving and experimenting with the software program, allowed them to validate and legitimize their knowledge.

In the common exams PLC, the department head facilitated the process of creating common exams. The final exam would be projected onto the Promethean board, and the teachers would read the question, talk about it, edit it if necessary, or delete and add a new question. This repetitive process created short-term learning loops for the teachers as through the processes of discussion, asking questions, and reflection, they worked together to establish commonality and

consistency in their final exams. They collectively were validating and legitimizing knowledge through their informal learning processes. These knowledge processes created learning opportunities for the teachers where they co-constructed knowledge and impacted their teaching practice.

In further analysis of the IPP Party, I found that interactions with colleagues do not always equate to valuable learning opportunities. Willy's attempt at a short-term learning loop in the IPP Party did not lead to a satisfying or positive learning experience. Willy was having trouble writing an IPP for one of her students. This student had Asperger's syndrome and because she was apprehensive about her knowledge base on this syndrome, she was looking for someone with more experience and knowledge to help her word the IPP goals. She turned to Albert for help. Unfortunately, Albert did not provide any further guidance other than telling her to "trust her professional judgement" (field notes). He explained that the district wanted to empower teachers and he told her that she had the necessary knowledge to write the IPP. During this interaction, Willy shifted the conversation to ask Albert for advice on another student, Janelle, which she knew he had previous experience in dealing with. I asked Willy to provide her perspective on this conversation:

> Well, I appreciate Albert, but he is a ladder climber. So he was all professional, inspiring and, I was like, "Oh, my God. He's so great," and then he turned into normal Albert, Albert that I remember. "Remember when we used to teach together, Willy? Remember when I used to tell you dirty jokes, Willy?" Normal, and I was like, okay, this is the Albert I like, because he's usually the kissing-baby, shaking-hands Albert. So when he shared about that girl with me, I felt this is awesome. And then as soon as he said, "I trust your professional judgement," all that was erased for me. So I was like, well, I'm not

> dealing with him. Why waste my time? It just made it weirder for me. (second semi-structured interview)

From this interaction, Willy felt inspired from Albert's belief that she had the necessary knowledge to write the IPP, but she also felt betrayed in how he flipped from being her friend to being a district representative. She had turned to Albert for collegial help and collaboration because they had worked well together in the past, but was met instead with district expectations and jargon, "trust your professional judgement" (field notes). Despite his knowledge base and divisional position, Albert did not help Willy. She still did not know how she was going to write the IPP and she was no further ahead in how she was going to solve her problem with Janelle. As demonstrated in Willy's experience, teachers may not always gain the specific knowledge they are seeking from their colleague. In this case, they must attempt their short-term learning loops with other colleagues or knowledge objects.

Relationships and Trust Within the Knowledge Culture

Throughout my analysis, I found that collegial relationships were an intrinsic part of the informal learning processes for the participants. The relationships the participants had with their colleagues provided avenues in which they could learn informally, share knowledge and resources with each other, and co-construct knowledge together. For some of the participants, these collegial relationships extended into friendships and influenced their personal lives. In the informal learning processes of the participants, there was interdependence between the individual and the social.

The PD days and PLC meetings presented important opportunities for the participants to reconnect with colleagues within their department or in the school. During an informal interview with Spirit, she told me that anywhere teachers come together they have the opportunity to talk

and then learn; most learning happens outside the classroom when teachers are talking and debriefing with colleagues. This was observed during all of the PD and PLC sessions through their informal learning processes. As the participants worked together with their colleagues in their PLCs, they were able to document, validate, and legitimize knowledge. It was also observed in the spaces that were created for teachers to congregate. In the areas where coffee, tea, and food were provided to teachers on the first PD day, the participants were observed having both personal and professional conversations with their colleagues. The participants would usually connect personally first with their colleagues (i.e., small talk or share anecdotes from their personal lives) and then progress into a professional conversation of their work and the knowledge they had learned in their session. The personal connections established between the participants and their colleagues created avenues for trust to be developed between them, which allowed for the teachers to be vulnerable in learning where they were willing to share their teaching practices and knowledge. When I asked the participants in the focus group as to how important trust was to them as professionals, Ashlee commented, "It's huge. That's what I think. It's huge. I go to the people I trust so if I want to learn, then I go to people that I trust."

In each of the PD and PLC sessions, the participants tended to gravitate to those whom they were closer to and had previously established relationships with. Michelle sat with her EAs during the Reading session and Ashlee sat with the teachers she knew from the school and other teachers in the district who were her friends. During the IPP party, Ashlee and Willy sat together, along with the teacher Ashlee team-teaches with, and Willy turned to Albert for help, as they used to work with each other and had established some trust and rapport. She was not observed asking any of the other Party Helpers for help. The collegial interactions between the participants and their colleagues were also much more meaningful in the PLCs then the ones in the PD

sessions. The teachers and EAs within the PLCs all knew each other, having worked together in the department for some time. As such, there was an establishment of trust between the participants and their colleagues. Ashlee, Willy, and Spirit were much more animated and engaged during their English PLCs than in the PD sessions I observed them in. They were working on their grade-books, helping to revise and edit the exams, asking questions of their colleagues, offering suggestions, ideas and feedback to other teachers, and sharing anecdotes. Willy and Ashlee were friends and during the PLCs, they would turn to each other for help and support. In Michelle's PLC, she also had friendships with her EAs and they worked very well together. She readily shared information with her EAs and promoted collaboration in her PLC, as opposed to running the program individually.

Trust was an important aspect to the participants' professional relationships because it influenced whom they would turn to when they needed help with a course they were teaching or during a PD or PLC session. The participants turned to colleagues they trusted because vulnerability is an inherent part of the learning process. Spirit explained this during her second semi-structured interview, "If you're open and vulnerable, which is difficult, I think, for teachers to do sometimes, to be vulnerable. And that really comes from a matter of trust and confidence." The participants may have to admit they do not know something and need help learning something. This was seen when Willy only chose to ask Ashlee and Albert for help during the IPP party, Michelle working so closely with her EAs in her PLC and during the Reading session, and during the English PLCs when Ashlee and Willy would turn to each other first if they had questions. It was also seen when Ashlee observed one of the Party Helpers providing an answer to a teacher in a harsher voice and Ashlee commented that she would not ask any questions of

her. The participants did not just ask anyone for help; they were selective as to whom they asked, which is a reflection of the level of trust in the relationship.

In observing the teachers interact with each other and in listening to their conversations during the PD sessions, vulnerability was expressed when teachers would go to share resources or ideas and accompany the action with statements such as, “I’m not sure the answers are right” or “I’m admitting my faults here” (field notes). They would put in place a mechanism where they were admitting that they did not have all the knowledge and did not know all the answers. They ensured their colleagues were not expecting perfectionism within their resources or ideas. This was also seen in the English PLC when the teachers were brainstorming or about to share an idea. They would pre-empt their ideas with, “This might be an idea” or “I’m not sure this will work, but let’s give it a try” (field notes). When Michelle was explaining her experience of mentoring other teachers during the IPP party, she lowered and softened her voice to mimic and emphasize the vulnerability the teachers expressed as they asked her questions. “As I walked around, it was almost like I'd look over people's shoulders and then they'd ask, [in a soft, tentative voice] ‘Is that a good goal?’ And I'm like, ‘Yah. No, that's fine’” (second semi-structured interview). The teachers were tentative in their questions because they were not sure they were writing the goals or outcomes appropriately.

During an informal interview with Spirit following the first PD day, Spirit said that learning comes from the kindness of others; to be able to speak with them and share what she is thinking and then have them share with her. There is a vulnerability to learning because a teacher does not want to seem incompetent and when they share knowledge or resources with one another, they expose their teaching practice to other teachers and open themselves up to the possibility of receiving criticism. In her journal entry, Willy shared an experience of having to

turn to her colleagues for support. “It is hard for me to ask for help and the closer we work together, the more we get to know each other. They are able to tell when I need help.” Willy has opened up and asked for help from her colleagues because she trusts and respects them, and feels comfortable being vulnerable with them. She is able to ask and accept the help and support they provide.

The professional and personal relationships within this knowledge culture are a necessity for knowledge construction. Learning occurred through the relationships the participants had established, particularly relationships that were respectful and trusting. There were personal aspects to these professional relationships, as they shared aspects of their personal lives with each other, which created opportunities for trust to develop and inevitably led to professional conversations and the co-construction of knowledge. The participants tended to gravitate towards the people they were the most comfortable with and trusted, creating more engaging and insightful learning opportunities. There was interdependence between the individual and the social, as each participant had relationships with their colleagues and it was through these relationships that their informal learning processes occurred and the participants validated and legitimized their knowledge. The teaching practice of the participants was directly influenced through these relationships, as they co-constructed knowledge with their colleagues.

Summary

The key points that emerged from my analysis of the participants’ social experiences, as described in the interviews, my field notes and observations, were as follows. Each of the teachers learned through informal means during the PD days and PLC meetings and each participant co-constructed knowledge with their colleagues and demonstrated individual and collective aspects of reflection and learning. The informal learning processes of trial and error,

asking questions, sharing pedagogical practices, mentoring and modeling teaching practices, problem solving, and reflecting were embedded within the participants' knowledge culture. These processes created opportunities for the participants and their colleagues to document, validate, and legitimize knowledge that was directly relevant to their teaching practice. I also found that technology played a key role in the documentation of knowledge and was used as a communication means between teachers. The informal learning processes that occurred during the PD days and PLC meetings had an impact on the participants' teaching practices and were the means in which they carried out their short-term learning loops, either collectively or individually. The teachers demonstrated these loops as they learned about *Gradebook* and in the creation of common exams. The participants greatly valued the time provided for teachers to work together in their PLCs. I found the participants to be most engaged in their PLCs, as they had the opportunity to work with those colleagues they were closest to both in terms of relationships and pedagogical alignment. These respectful and trusting relationships provided a safer means for the teachers to learn and validate and legitimize their knowledge.

In this chapter, I have described my observations of the PD days and PLC meetings that the participants were a part of. I have also detailed how the participants documented, validated, and legitimized knowledge with their colleagues and through the knowledge object of technology. I have demonstrated the impact collaborative processes within the PLCs had on the participants' teaching practice and the importance of trusting, professional relationships to their learning. Throughout the PD days and PLC meetings, there was an amalgam of formal and informal learning opportunities and teachers were able to co-construct knowledge with other teachers through their informal learning processes. In the next chapter, I will discuss the participants' knowledge culture in detail, in terms of the interplay between formal and informal

learning and the influence this formalization had on the teachers' informal learning. I will also describe their collective way of knowing, and how they access, accumulate, distribute, and envision knowledge.

Chapter 6 – Discussion

This chapter builds on the interpretations from chapters four and five, as I widen the scope of my interpretations and reflect on the research question and sub-questions more holistically. I explore the compelling aspects of the text or key findings that were similar in both the individual and social processes of learning for the participants and expound on the common themes as I consider the whole of the research context in relation to the parts. The discussion in this chapter will provide interpretations of the findings in relation to the previously reviewed literature and will address the research question, how does a teacher experience informal learning, and the sub-questions: what is the impact of informal learning mechanisms on their teaching practices; what is the interdependence between formal and informal learning and individual and social processes in teacher workplace learning; what are the mechanisms and tools used by teachers to co-construct knowledge with their colleagues; and what is the impact of infrastructure, professional relationships, and practices on teacher learning? This discussion will illuminate the knowledge management practices within this knowledge culture.

In this chapter, I examine and discuss the key findings of this study. I will begin with a characterization of the participants' knowledge culture and discuss how the participants were learning informally within their knowledge culture and identify the informal learning processes that were unique to this knowledge culture (i.e., learning from mistakes during experimental or trial and error processes and learning informally with students). I will then examine the unique aspects of the short-term learning loops for teachers that involved the collaborative and reflective processes of problem solving and brainstorming rather than a heavy reliance upon knowledge objects. From here, I progress to a detailed consideration of the wider context in which the participants' informal learning was occurring; this context had prevalent formalization structures

that entangled with their informal learning and affected the participants' collaborative learning in terms of time restrictions for the PLCs and their conversations, and reduced professional autonomy in the decision making process for their PLCs and of their learning. In this entanglement, I also explore the exclusionary (i.e., impact of formalized informal learning on knowledge construction) and inclusionary (i.e., impact of trust and relationships on knowledge construction) knowledge influences in the knowledge culture. I conclude this chapter with an examination and discussion of the teachers' knowledge domain, in terms of how they share tacit knowledge through their informal learning processes, and the unique dimensions of teacher knowledge and how it is managed. This entails a discussion of teachers' collective way of knowing and examination of how they accumulate, distribute, access, and apply knowledge, and their inquiry practices of validation, legitimization, and documentation. My interpretations are creative and transformative because they explore teaching informal learning within the conceptual framework of a knowledge culture and provide the aspects of my research that are unique when compared to the previously reviewed literature.

The Knowledge Culture

The participants in this study were learning on a continual basis within their knowledge culture. The school context was the basis of this knowledge culture and provided learning experiences to the teachers through their daily work activities as they interacted with their students and their colleagues, which included their fellow teachers and EAs. The workplace learning of the participants was consistent with previous literature, where the participants had opportunities to apply the knowledge they had gained from a PD session, PLC meeting, workshop, or from their colleagues during and after these meetings (Billet, 2001; Boud, 2003). Work was learning for the participants, as their learning processes were an inherent part of their

work activities (Billet, 2003; Merriam et al., 2007). The workplace learning of the participants was dynamic and interactive (Carter & Francis, 2001), allowing them to improve their professional practices through their knowledge construction processes with their students and colleagues. In each of the classroom observations and those made during PD and PLC sessions, the teachers were learning in a variety of different ways and were actively participating in their knowledge culture with their students and colleagues. The participants' informal learning processes were also consistent with previous literature, but there were some ways the teachers learned informally that were different. These mechanisms included learning from mistakes, learning informally with their students, and an entanglement with formal learning. This progression from the previous literature will be explored in the next sections of this chapter.

Teacher Informal Learning Processes

This study was designed to explore how a teacher experiences informal learning and extends the knowledge of how teachers learn within their workplace. Through the examination of the informal learning of a teacher, many of the descriptions of informal learning and associated activities identified from previous literature were noted. The participants' informal learning was very much a part of doing their job (Boud & Middleton, 2003) and there was a reflection and action process linked to the learning of others (Feiman-Nemser, 2008; Marsick & Watkins, 2001). It was both reactive and deliberative (Eraut 2004, 2007), and intentional and unintentional (Berg & Chyung, 2008), where the teachers would seek out other teachers to help them learn or they would learn as a result of carrying out their work. Following their interactions with other teachers, EAs, or students, the participants described reflecting on the information they had gained. In this reflective process, they pondered the experiences or knowledge shared with them from others in comparison to their own personal experiences (Eraut, 2004). This reflective

process created opportunities for them to contemplate their teaching practice in relation to other teachers and make any necessary changes to their current pedagogy. It was also a context for the teachers to collectively validate, legitimize, and document knowledge within their knowledge culture. This reevaluation of their pedagogical practices in relation to these processes allowed them to advance their knowledge within their knowledge culture. The teachers' heuristic practices entailed the use of different informal learning processes to acquire knowledge, and to construct and reconstruct their epistementality.

Short-term learning loops. Nerland (2008) described the short-term and long-term learning loops of computer engineers within their knowledge culture. The short-term learning for these professionals involved the use of readily available knowledge objects for experimental practice. For the participants in this study however, their short-term learning loops, as analyzed and described in chapters four and five, involved the collaborative and reflective processes of problem solving and brainstorming rather than a heavy reliance upon knowledge objects. For example, when Ashlee approached Willy with questions about Willy's binder of resources, she relied upon Willy to help her solve the problems she was having in her interpretation of the materials and in the translation of these resources into learning opportunities for her students. Ashlee was not able to generate satisfactory answers on her own and she found it more beneficial to turn to Willy for knowledge and support. She knew that Willy had the experience and knowledge about her problems and found it more fruitful to gain her opinion and advice then working through the problem individually.

In this short-term learning loop and the others from chapters four and five, the participants' teaching practices were impacted because they would make changes to their lesson plans or assessment strategies as a result of the conversations they had with other teachers and

their reflective processes. In this regard, the participants' considered their own teaching practice in comparison to another teacher's. This is consistent with Hoekstra et al.'s (2009) findings where teachers learn informally by considering their own teaching practice and getting ideas from others. It is also consistent with Dewey's (1938a) ideas of learning from experience. The learning of teachers takes place through their social interaction in their workplace and through inquiry and reflection. Although the act of teaching is individual in that it is usually one teacher in front of a group of students, a large portion of the knowledge needed for teaching comes from other teachers, their students, and the various teaching experiences they have had. The participants quite readily turned to other teachers for support and knowledge, as they realized this was more fruitful than endeavoring as an individual teacher solely on their own. This collegial reflective process lead to knowledge generation and action in their teaching practices in that, either a change would occur in their teaching practice or they would further enhance their current methodology.

Other informal learning activities. Hoekstra et al. (2009) and Wei et al. (2009) provided further examples of informal learning activities which included learning by experimenting or through teaching experience, school-based coaching and mentoring, and participating in joint work activities. All of these activities were observed and characterized throughout chapters four and five and were consistent with this previous literature. However, a description that was not found in this literature was learning from mistakes during experimental or trial and error processes and the informal learning that occurred with students. This description of learning from mistakes and learning informally with students extends the knowledge of teacher informal learning.

The participants learned through trial and error when they experimented with implementing new resources, worksheets, or activities in their classrooms, or ideas gained from another teacher, a workshop, or website. From my observations and analysis, these trial and error processes also involved learning from mistakes. For example, Willy had commented how making mistakes were an important learning process in the workshops she had attended. Making mistakes in the workshops allowed her to become better at the skill she was learning because she gained feedback from the other teachers or the instructor on different ways of completing the skill, and would then share these ideas when she instructed her students. One of the ways Marsick and Watkins (2001) characterized informal learning was it being triggered by an internal or external jolt. The mistakes Willy and the other participants experienced in their learning created this internal jolt for them. Upon making the mistake in the workshop, Willy realized she did not have the answer on how to proceed next and turned to her colleagues for the necessary knowledge. She reflected on the information she received and figured out her next course of action. Her learning experience then allowed her to teach the skill to her students in a more informed manner, as she could anticipate the struggles her students might face and was able to circumvent these.

As teachers make mistakes in their pedagogical practices, it creates opportunities for them to enter a short-term learning loop and reflect on their teaching to figure out what went wrong. The mistakes create obstacles in their learning and the teachers must brainstorm different ways of correcting or overcoming it. At times, part of this reflection process involves turning to colleagues for knowledge and considering the information they receive against their knowledge of their students and their knowledge of their teaching practice. The knowledge they received and the subsequent reflection process gives them time to reevaluate their teaching in relation to

this knowledge and figure out what they need to change to correct the mistake(s). Making mistakes are a pivotal part of learning from experience, as they create opportunities for teachers to construct knowledge, initiate change in the pedagogical approaches used, and evolve their teaching practice through collaboration and reflection.

Learning informally with students. The participants in this study were also observed learning informally with their students in their classrooms. During classroom observations, the participants were seen engaging in conversations with their students about the topic at hand. In these conversations and while the teacher was instructing, the students would ask questions on the topic. These questions served as learning moments for both the student and the teacher. The questions would provide opportunities for the teacher to deconstruct the knowledge being taught. In this deconstruction process, the teacher provided more detail on the topic at hand or explained the knowledge in a new way (i.e., used an anecdote or analogy). This deconstruction then led to both the teacher and the students reconstructing the knowledge. The students reconstructed it in terms of gaining more knowledge or further clarification to help them understand the concept and the teacher had the opportunity to reflect on the knowledge and gain insight into how the students were interpreting it. This allowed them to make any necessary changes to their lesson or to the materials being used. The questions students asked would provide teachers with insight into their teaching practices and the resources they were using. Upon reflection of the conversations they had with their students and the questions that were asked, the teachers would make changes. Although the learning that occurred with students may not have been to the same extent or depth as to what would occur with a colleague, the participants did learn informally with their students and this informed their daily teaching practice.

Collaboration. From the informal learning processes discussed, collaboration was an inherent part of the participants' informal learning activities. The collaboration the participants described during their interviews or that was observed during PD/PLC sessions was consistent with previous literature. The participants had genuine personal and professional relationships with their colleagues and students (Lavié, 2006; Musanti & Pence, 2010; Wei et al., 2009). The teachers learned from each other in the observed PLCs, and the relationships they had developed with their colleagues were important constituents of their learning processes (Musanti & Pence, 2010; Wei et al., 2009). Michelle had close relationships with her EAs and worked together with them to strategize improvements for their student programs. She readily utilized their feedback throughout the workday to influence the decisions she made about activities the students were completing or in adapting an activity for a student. In the English PLC, the teachers collaborated on decisions for their assessment practices and in creating common exams. In their informal learning activities, the teachers had a shared responsibility for participation, decision-making, and outcomes (Piercey, 2010), and by working together they were more productive than if they had worked individually (Rosenholtz, 1991). By working together with their colleagues, the teachers were able to gain new ideas on how to teach or modify their approaches of instructing the curricular outcomes in their classroom and different ways of assessing their students. They were able to progress and evolve their teaching practices as a result of working collaboratively with other teachers and EAs, and establish commonality amongst their assessment practices and consistency within their programs. The teachers' heuristic practice of collaboration led to knowledge production through the generation of new ideas and the advancement of existing practices. Collaboration was an important constituent of their short-term learning loops.

In the previously reviewed literature, collaboration and informal learning processes have been characterized as progressing without issue with all teachers working and learning together cohesively. Up until this point, it has seemed that all teachers need to do is find another teacher, ask questions, and they will receive the knowledge they require. However, the informal learning of teachers is much more complicated than that, as there are many external and internal influences placed onto these collaborative interactions between teachers and their colleagues. In the informal learning activities within this study there were exclusionary and inclusionary knowledge influences and prevalent formalization structures that affected the participants' collaborative learning processes. It is in the exploration of these influences that my research extends and progresses knowledge on teacher informal learning. In the next part of this chapter, I will explore the formalization of teacher informal learning and the exclusionary and inclusionary knowledge influences that affect the teachers' knowledge construction processes.

Knowledge within the Knowledge Culture

The experience of informal learning for the teachers in this study involved an entanglement of formal and informal learning and knowledge construction processes with colleagues. Discussion in these areas will characterize new understandings on the extent and manner in which informal learning is formalized and managed, and on teachers' tacit knowledge and their inquiry practices of validation, legitimization, and documentation. These descriptions will advance understandings of the teachers' knowledge domain in terms of their collective way of knowing and how they accumulate, distribute, access, and apply knowledge.

Entanglements of Formal and Informal Learning

When I initially set forth to carry out this study, I presumed that the informal learning of the teachers would be quite distinctive from the formal learning opportunities, where I would be

able to see clear distinctions between the two. However, this was not the case. I instead found that most of the participants' workplace learning was an amalgamation of formal and informal opportunities. From their study of formal, informal, and non-formal learning, Malcolm et al. (2003) encouraged future research to consider the wider context in which learning was occurring because the interrelationship between formal and informal learning influences the nature of learning within a specific context. Formal and informal learning opportunities co-existed within the workplace of teachers and were very much intermingled together (Colley et al., 2003). Colley et al. (2003) argued, "there are deliberate efforts being made to formalise schoolteachers' learning" (p. 39), and these entanglements of the formalized structuring were prominent throughout the participants' informal learning experiences.

Formalizing the Informal

In this study, the formal structuring of the PD days and PLC meetings were policy driven, organized in a top-down approach (Hoekstra et al., 2009; Lom & Sullenger, 2011), and the school board and school primarily utilized a traditional PD approach to bring about teacher learning (Bayrakci, 2009; Diaz-Maggioli, 2004). The school board chose the literacy theme, organized the PD day, and implemented various software programs and web applications without soliciting feedback from the teachers in terms of what they wanted to learn about or use. The administration organized the PLCs during the school day and had time restrictions placed upon them. The school administrators decided when the PLC time would occur, how much time the teachers would get to work in their PLCs, and the material they would work on. The English Department Head and teachers were able to decide how they would accomplish these tasks, but ultimately it was their Department Head who made the final decision on how they would use their time. Michelle, being the lead teacher for her program, was the one who decided on the

topics for their PLC time and set their agenda. The PLCs ran more like department meetings, since there were agendas to follow and topics to be covered.

During the organized PD days and PLC meetings, the teachers were given time to work together with each other and they were learning informally in and amongst the formal structuring of these sessions. As described in chapter five, the teachers worked with each other as they were learning about *Google Docs*, Michelle collaborated with her EAs for program planning, and the English PLC worked collaboratively to learn about *Gradebook* and to create common final exams. Knorr Cetina (2007) argued, "knowledge cultures have real political, economic and social effects which are not neutral with respect to social structures and interests or with respect to economic growth" (p. 370). These effects were seen in the formal structuring and organization of the PD and PLC sessions and constrained the teachers' informal learning opportunities. Availability of provincial and local school board funding and the school timetable led to time restraints on the duration of the PLC and frequency of meetings. These effects constrained the teachers' informal learning opportunities because it reduced the amount of time they had to talk with each other and reduced the potential of co-constructing knowledge. They also impacted the professional autonomy of teachers because they did not have input into how much time they wanted for PLC time or for the duration of these meetings. Informal learning is an important mechanism for constructing tacit knowledge and all manners of time restriction reduce the capacity for this to occur. The less time the teachers have to talk with each other, the less time they have to validate, legitimize, and document knowledge. This reduces the impact on changing and evolving their teaching practices.

Knowledge Influences

Within this study, there were prominent influences on the knowledge the teachers were learning. These influences came from external sources such as provincial and district policies and internally as the teachers were working together in their PLCs or during PD days. Lahn and Jensen (2007) argued, "researchers of 'situated learning' may underestimate the institutional forces that will pull local negotiations on professional authorization along certain trajectories and rule out others" (p. 70). Provincial and board policy initiatives and funding were the driving forces behind the organization of the PLC and PD sessions and on the content and material that was delivered to the teachers. These institutional forces directed the knowledge of teachers along particular trajectories. The planning and organizing of their PD and PLC time was controlled in a top-down approach and there was no consideration for the mastery level of the teachers, in terms of their progression in their career, their progression with software/technology, and their individual needs in these processes. These management practices aligned with the restrictive learning environment identified in Hodkinson and Hodkinson's (2005) study on teacher workplace learning, as the teachers' learning was prescriptive, imposed, and used as a mechanism to comply with provincial and board policies.

In chapter five, I described the participants' implementation of teaching strategies they had gained from the Literacy PD day. Ashlee and Michelle had experimented with some of the reading strategies they had learned from their session, but Spirit and Willy had not implemented anything from their digital literacy session on *Google Docs*. During the second semi-structured interview, Spirit called the *Google Docs* web application a "bandwagon" because the district had chosen this application without seeking input from teachers. Spirit mentioned that she had spent the previous summer learning and using other websites, which she found to be better. She went through the motions of learning about *Google Docs* that day but was not readily implementing it

into her classroom. For Willy, the digital literacy session did not meet her learning needs, as she did not find the technology to be relevant to her classroom context and she was not given the opportunity to provide input into what type of literacy teaching strategies she would like to learn about. Although the formalized structuring of a PD day is a way to provide PD to many teachers at once and there was a variety of literacy sessions provided, the sessions were generic in nature and did not consider the individual needs of the teacher. In this regard, Spirit and Willy were left deficient in their learning needs from their PD experiences. The school board's unilateral decisions on the content provided during the PD day, influenced the teachers' knowledge base and paid no regard to their autonomy in this process or in their learning.

Knowledge influences were also seen in the PLCs, particularly in the English PLC when they were working on creating common final exams. The assessment practice of establishing commonality in exams was determined at the district and school levels; the English teachers did not decide on their own to use the same final exams in each course. The premise for this practice demonstrated part of the district's mission for collaborative learning and was a mechanism to encourage consistency across school departments. However, this mandate challenges the professional autonomy of teachers and further emphasizes the formalization of teacher learning. The teachers were told that they must create and utilize the common final exams as opposed to creating final exams that would suit the specific and individual learning needs of their students within their classrooms and be representative of the teaching style used by the teacher in the course. The English teachers were also told that this process would be completed in their PLCs. In this process, the teachers were somewhat able to negotiate the trajectory of their learning within their PLCs because they could provide feedback to their department head as to how they would like to complete this work and were able to control their informal learning within this

structure. Although they could control their validation, legitimization, and documentation processes, they were not given a voice into what they would like to work on or learn about during their PLC time. The management of teacher PLC time and content creates a smokescreen for teacher learning where at first glance it seems that teachers are only learning informally within their PLCs. However, this is not the case. They are instead learning informally within a controlled and formalized structure that challenges their professional autonomy and directly influences their professional knowledge.

Providing generic profession-specific knowledge in PD days and determining the content of PLC meetings does not meet the teachers' individual pedagogical needs and does not always have relevance to their teaching practice. The lack of ownership and autonomy in their professional learning can leave teachers frustrated and deficient in their learning needs. This reduces motivation for engaging in future PLC/PD sessions and limits the ability of a teacher to impact and progress their pedagogical practices.

Exclusionary influences. According to Knorr Cetina (2006), professionals' epistementalities inform decision-making about what knowledge is included or excluded in their knowledge culture. There are power effects from this decision-making process, in terms of limiting access to knowledge and deciding who is able to acquire knowledge through certain channels. These decisions and limitations may lead to conflicts or struggles (Knorr Cetina, 2006). When the school board and school administration are making decisions in regards to teacher PD and the material to be covered in the PLCs, they are unilaterally deciding upon the professional knowledge teachers will learn. They decide the structuring and content of these sessions, which is limiting the teachers to a specific base of knowledge and how they acquire this knowledge. This was seen in the IPP Party.

During the IPP Party, teachers were encouraged to collaborate within the structure and rules of the afternoon, "#1. Do not get rowdy, #2. Collaborate!" (document, IPP handout). The teachers were asked to complete their IPPs in the library amongst administrators and a district official, and this administration had created boundaries on the teacher collaboration in terms of when and where the collaboration would occur and how the goals and outcomes should be written. Having the teachers all together is conducive to collaboration as teachers are in close proximity to each other and it is easier for them to consult one another. However, collaboration in this setting was juxtaposed against the formalities of the afternoon. The teachers were encouraged and told to collaborate, but at the same time, were told to direct questions to the Party Helpers and to not get rowdy.

In order for teachers to collaborate, there must be conversation. It is a necessary part of this process as the teachers discuss the IPP they are writing and ask questions of each other. These are important mechanisms for the teachers to get at the specific tacit knowledge of another teacher and for them to validate and legitimize their IPP writing process. The juxtaposition of this setting sent mixed messages to the teachers. They inherently wanted to ask questions and seek clarification, but were stifled by rules and a structured environment, both in terms of the setting, time, and presence of administrators. The structuring and content of this PD day, led to the teachers acquiring and distributing knowledge in a particular manner. The teachers were not given the option of writing their IPPs in smaller environments such as in their PLCs or with a group of teachers of their choosing. The school administration established boundaries on which information the teachers would have access to and how the writing process would occur. This exclusionary influence on the teachers' informal learning negotiated the trajectory of their learning, as it directed how the teachers accessed and applied knowledge for their IPPs and

controlled how the teachers distributed their knowledge. Their validation and legitimization processes were constrained according to a pre-established process, limiting the capacity for them to learn informally. The exclusionary influences further challenged the teachers' professional autonomy, as they did not have ownership over the IPP writing process and their learning.

Inclusionary influences. Power effects from decision-making and seeking power from knowledge also comes about when a knowledge culture is more inclusionary or open about knowledge attainment and the knowledge that has been gained (Knorr Cetina, 2006). Knorr Cetina (2006) argued, "[an] individual may derive trust and other benefits from permitting others to see and understand his or her personal predicaments" (p. 38). Informal learning processes are mechanisms teachers use to share the knowledge they are accumulating and accessing and for them to co-construct knowledge. These processes are inclusionary as the teachers collectively validate, legitimize, and document knowledge within their PLCs. In chapter five, I examined the importance of relationships and trust to the participants' informal learning processes and knowledge construction. Trust is the willingness to increase your vulnerability with someone else (Zand, 1997) "on the basis of the confidence that they are benevolent, reliable, competent, honest, and open" (Van Maele & Van Houtte, 2011, p. 440). The participants' exhibited preference of turning to trusted colleagues was consistent with Zand's and Van Maele & Van Houtte's explanations. They were willing to be vulnerable within the collaborative practices of their workplace. The participants learned through the trusting and respectful relationships they had established with their colleagues, sharing their knowledge attainment.

Although this also correlates to Knorr Cetina's arguments, in these professional relationships, there was variance in the depth of these relationships and the extent to which personal relationships would form. The participants did not have close working relationships

with all of their colleagues in this inclusionary framework and the effects of sharing knowledge openly in their PLCs were not always positive. In some of the relationships, miscommunication, disrespect, a lack of trust, or conflict arose, and this disrupted the participants' learning. In this regard, teachers do not always learn from every colleague within their knowledge culture and they can be selective in terms of whom they turn to for help. Inclusionary influences of trying to learn with other colleagues and sharing in the knowledge construction processes do not always equate to vibrant informal learning opportunities.

Spirit experienced informal learning differently from the other participants in the study because she preferred the anonymity of the online environment for resources and support instead of from the members of her English department. This was because the websites provided her with a wealth of resources at her fingertips, which was very different from her experience of having to create all of the resources from scratch. It may also have been due to the vulnerability in learning and the tension this creates for Spirit. Because she is a veteran member of the English department, there is the assumption that she has mastery of the curriculum and a solid understanding of the English resources. However, because she is new to teaching the course there is a vulnerability to admitting this to the younger members of her department. Her background is in English but that knowledge base was developed back in university, and since then, she has been spending more time teaching K&E. The tension between being a novice learner for the English courses and at the same time being a veteran member of the department spurred her towards the anonymity of the online environment.

The tension Spirit experienced demonstrates some of the social and power effects within the knowledge culture. In the informal learning process, teachers carry out conversations and ask questions of each other in hopes of bringing about tacit knowledge that is being sought. As tacit

knowledge is shared, the teachers then progress into reflective processes of validating and legitimizing this knowledge. This knowledge construction process can be a vulnerable process because the knowledge shared with another teacher may not be validated. There is a good chance that through the critical discourse process, some knowledge will not be legitimized through the validation and legitimization processes. There is also vulnerability when a teacher is asked to share knowledge based on their experience and she is not able to. The inclusionary influences can create tension and unease as a result of these critical discourses and not having the answers other teachers are seeking. In Spirit's case, she found comfort in the anonymity of the online environment due to the vulnerability inherent in the informal learning processes and the tension between being a master teacher in terms of her teaching experience and a novice teacher in her English courses. The inclusionary influences in this knowledge culture caused Spirit to find an alternative way of learning informally.

The inclusionary and exclusionary influences lead to discontinuity in the teachers' informal learning processes and these knowledge influences have forced them to reinvent their heuristic practices or knowledge relations, which includes such things as activities, instruments, and ways of envisioning knowledge. The teachers have begun to use more technology to communicate with other teachers and as a mechanism to gain knowledge and resources, and they have readily utilized the spontaneous moments of interactions with other colleagues. These interactions come about when teachers meet each other in different spaces of the school such as the washrooms, the playground during supervision, or in the parking lot afterschool. These spur-of-the-moment conversations in various spaces of the school have created opportunities for the teachers to learn-on-the-fly and in spaces that are not structured as formally as their PLCs. The discontinuity experienced within this knowledge culture has lead to evolvement of their heuristic

practices. The knowledge influences have put adaptive pressure onto how the teachers learn informally from each other and how they produce knowledge. They are part of the wider context in which teacher learning is occurring and are important constituents in how a teacher experiences informal learning.

Teacher Knowledge and Inquiry Practices

The second part of describing how a teacher experiences informal learning involves an examination of the teachers' knowledge domain, in terms of their collective way of knowing and how they accumulate, distribute, access, and apply knowledge, and their inquiry practices of validation, legitimization, and documentation. Although some of my findings were consistent with previously reviewed literature, in the upcoming discussion I will provide new understandings of teachers' knowledge in terms of how informal learning activities bring about the sharing of tacit knowledge amongst teachers and the unique dimensions of teacher knowledge and how it is managed.

Knowledge and Learning

In chapter two, I provided distinction between knowledge and learning for this study. Throughout this study, these distinctions held true. For the teachers in this knowledge culture, their learning was a knowledge producing process, in which they generated knowledge through their active participation in their workplace. The teachers both influenced, and were influenced, by the social and cultural factors of their workplace, and there was an enmeshment of individual and social processes (Fenwick, 2010), as seen throughout the previously described informal learning processes. These learning processes were very important for teachers, as it was through these processes that they created knowledge. As presented previously, Dewey (1938b) argued that the act of knowing constitutes a series of actions where individuals are together trying to

solve problems in particular contexts; knowledge is the end result of this inquiry process, where the meaning derived is stable and stands separate from the inquiries. This held true for all of the participants, particularly in regards to their short-term learning loops. The teachers would seek the input from other teachers to help them solve problems in their teaching practice. Together as the teachers solved the problem, they would produce knowledge.

Knowledge for the teachers in this study was a form of understanding or awareness that existed at a particular time and was generated through reflection and abstraction (Chakravarthy et al., 2005). The knowledge that the teachers were producing took on many forms, of which will be detailed later in this next section. Throughout my observations and in the interviews with the participants, they would describe sharing information with each other in their learning processes or would describe information that they were hoping to get from other teachers. This was seen when Willy described approaching colleagues with questions about their English resources or when Spirit would use the TES website to gain ideas for her class. The knowledge the teachers were seeking was both superficial and deep (Chakravarthy et al., 2005). The knowledge was superficial when the teachers would share facets of information or facts with each other, either about their teaching practice or their students. The teachers would construct deep knowledge through their interactions with their colleagues or in their validation and legitimization processes. This deeper knowledge was characterized as tacit knowledge in this study. This knowledge creation process involved both individual and collective processes, where individually they created knowledge through reflection and learning, and collectively through their informal learning processes. As such, professional conversations, asking questions of each other, and critical discourse were important components of this co-construction process.

Tacit Knowledge

Tacit knowledge is having an innate understanding of the work carried out and knowing how to complete it. This study aligns with Polyani's (1966) view of tacit knowledge, where employees have a hard time articulating everything that they know. There are ineffable elements to their knowing, and this makes the transferring of tacit knowledge difficult. Tacit knowledge cannot become fully explicit and is instead inherently linked to social learning processes (Tsoukas, 2005). The talk or language used during informal learning activities serve as triggers for tacit knowledge. As employees carry out activities, they are able to ask each other questions and make statements that will prompt reflection or connections to the particular context at hand and bring tacit knowledge to the forefront. "Through instructive forms of talk (e.g. "look at this", "have you thought about this in that way?") practitioners are moved to *re*-view the situation they are in, to relate to their circumstances in a different way" [emphasis in original](Tsoukas, 2005, p. 424). The conversation amongst colleagues during informal learning activities creates opportunities for employees to seek aspects of tacit knowledge that were ineffable and to share this knowledge with each other. The transfer of tacit knowledge is not simply a manner of making it explicit, but rather involves reliance upon conversational triggers that target specific tacit knowledge. This reflection upon and reconnection to various aspects of their tacit knowledge allows employees to see new connections and progressively change work practices.

In this study, the teachers' tacit knowledge encompassed many different dimensions within this knowledge culture such as subject-specific knowledge, theoretical and practical knowledge of assessment, classroom management, and child psychology, and knowledge of the specific learning needs of their students. Dewey (1904) had argued that a teacher's professional practice is informed and developed through a combination of reflecting upon their teaching experience and of the theory gained from university and professional development activities. I

would argue that some of this professional practice knowledge and other dimensions of their knowledge were generated through interactions and reflections between teachers during their social learning processes, which in this study are their informal learning activities. The conversations the teachers had during these activities were important constituents to their learning because it served as prompts for the teachers to share both superficial and tacit knowledge and reevaluate it through critical discourse. The teachers were then able to collectively validate and legitimize this knowledge, and document and/or display it in knowledge objects and through their use of them. These knowledge practices allowed the teachers to evolve their teaching practices. Through an examination of their knowledge dimensions and domain, this study will expand understandings of teachers' social learning processes and in particular, how they experience informal learning. These understandings of how informal learning brings about the sharing of tacit knowledge amongst teachers will be explored in the next sections.

Validation, Legitimization, and Documentation of Knowledge

The informal learning activities created a social context in which the teachers could come together either as a collective group or with other teachers of their choosing, and created opportunities for the teachers to carry out conversations and ask questions of each other, which enabled them to access the superficial and tacit knowledge of other teachers. This aligned with Feiman-Nemser's (2008) research on teacher informal learning, where the observed learning processes of the participants were dialogical as they were seen critically examining new information and reevaluating it in terms of their existing knowledge.

The informal learning activities the teachers participated in very much involved the knowledge objects of their workplace and were transformative for them, as they interacted with the objects. As noted earlier, knowledge objects are more than just definitive things; they are also

processes and projections that are characteristically open, question-generating, and complex (Knorr Cetina, 2006). Jensen (2007) reasoned this was because the knowledge objects generated "a 'looping back and forth' between [the] objects and persons" (p. 492) as a professional sought out knowledge. The progression of moving back and forth between an object(s) and persons, allows for the necessary time for the semantic aspect (meaning) of tacit knowledge to become apparent from the object (Polanyi, 1962). The individuals interacting with the object(s) have time to dwell in the object(s) and assimilate new knowledge. This looping back and forth and assimilation process was seen during the English PLC in their common exam session and was in some regards similar to the knowledge-seeking dynamics described in Jensen's (2007) collaborative study. Jensen (2007) described professionals as looping between theoretical and practical knowledge when they first entered their career and having strong emotions when seeking knowledge. This study extends this knowledge through a focus on how the teachers co-construct knowledge through the use of their knowledge objects and how their informal learning activities inherently involved their knowledge objects.

In the creation of a common exam, the teachers in the English PLC utilized computers, a projector, curricular documents, previous exam questions, and a Word document. As the teachers were talking about final exam questions they would evaluate a question based on its merit and the experiences of the teachers. The teachers would share how the question was relevant to the curriculum and how they taught this particular outcome. As a group, they would then decide if the question was relevant or needed to be edited or deleted. The collective decisions made in this process involved reliance upon the tacit knowledge of the teachers who had previously taught the course and used the exam questions, and a consensus on this knowledge. The conversation around the exam questions would trigger past experiences teachers had with the curricular

content and they would share these experiences with their colleagues. As the teachers studied the exam question, they would analyze it for its fit with the curriculum, diploma exam standards, previous student performance, and their know how of teaching the curriculum to the students. The question would convey information (i.e., curricular content, question difficulty) to the teachers and using their skills, which were based upon their theoretical and practical knowledge bases, they would analyze the question and make decisions. Each of the teachers that had experience with the course and question would share feedback different from the other teachers; the variances in their knowledge bases created variances in how they read and analyzed the question.

The varied feedback generated looping back and forth between the exam question/curricular documents and the shared tacit knowledge, allowing the teachers to make a decision about the question and in the process, validate and legitimize their assessment knowledge and standards. The different perspectives and tacit knowledge shared during this interaction provided more opportunities for the semantic aspect of the question to become apparent and for the teachers to validate and legitimize this knowledge. In the decision making process, they critically examined the shared tacit knowledge and validated and legitimized certain arguments and knowledge from the conversation. In this critical examination or as Adger et al. (2004) referred to it, a negotiation of meaning, the teachers came to a consensus on their assessment knowledge. The validation and legitimization processes allowed knowledge to be co-constructed from the conversation that was had about the question and from the question itself, and for the teachers to interiorize or assimilate the new knowledge. The co-construction of their assessment knowledge was the end result of this inquiry process and through their negotiation of meaning they established stability of this knowledge that would be used in their assessment

practices. The conversations the teachers had and the questions they asked each other, brought about tacit knowledge and allowed them to come to a consensus on how they would assess the students, which informed future assessment practices within the English courses. This collaborative process essentially created more opportunities for the teachers to learn than if they were to create an exam on their own.

Another example of the teachers' inquiry practices was when the participants described coming across curricular content that they needed help with. They would either use a knowledge object such as a textbook or website to seek the knowledge or they would turn to a colleague. When Willy gave Ashlee her binders for the English course, she was providing Ashlee with knowledge for the course. It was documented in the lessons and resources within the binder, and then in the PowerPoint's Ashlee generated for the course and on the activity sheets she gave to her students. As Ashlee was preparing for her course and then when she was teaching it, she would work her way through the knowledge in the binders and then ask Willy questions to get at specific tacit knowledge that was not in the binders. This process was transformative for both of them as Ashlee was able to learn from Willy and received the necessary knowledge to effectively teach her course, and from the questions Ashlee asked and their resultant conversation, Willy was able to reevaluate her practice as she shared her tacit knowledge. The collaborative discussion that resulted from the use of the binder provided opportunities for the teachers to validate and legitimize the knowledge needed for teaching the course and their teaching practices. Each of their teaching practices evolved from this collaboration and these inquiry practices. As Ashlee made her way through the binder and tried to learn the content and figure out how she would teach the material, she was dwelling in the object and was working towards creating new knowledge. When she spoke with Willy, the conversation created opportunities for

her to validate and legitimize the knowledge she had been learning. Ashlee looped back and forth from the binder, Willy, and herself, and this created opportunities for questions and discussion to arise, which provided an avenue for tacit knowledge to be triggered, shared, and reflected upon in terms of re-evaluating teaching practice. This informal learning process of collaborating and sharing teaching resources provided opportunities for the teachers to co-construct knowledge as they contemplated and discussed documented and tacit knowledge.

In the creation of the common exam and in Ashlee's reinterpretation of Willy's English teaching resources, there were opportunities to reevaluate their teaching and assessment practices in comparison to the validated and legitimized knowledge. The conversations created opportunities for the teachers to critically reflect upon their past experiences, weigh these experiences against those of other colleagues, and consider their individual teaching practices in terms of what they would retain or what they would change. In this manner, the teachers were able to assimilate the new assessment knowledge and allow for their individual assessment practices to evolve in connection to this new knowledge. Informal learning activities are important mechanisms for teachers to access tacit knowledge that would otherwise remain ineffable. Teachers working together in a common area create opportunities for teachers to trigger tacit knowledge from each other, which can then be reflected upon, validated, and legitimized, allowing for changes in teaching practice to come about. Questions posed by teachers bring forth features of teaching practice that may have not been considered, and it is in the re-examination of these teaching practices in comparison to others that a teacher can evolve their teaching practice. It was in their conversations that the teachers co-constructed knowledge through critical examination of their tacit knowledge. Whether as a new or experienced teacher

within this collaborative work activity, the teachers were able to learn from this collaborative process and the conversations that were had around each question.

Role of questions in conversation. Within the literature on the social construction of knowledge, there is particular emphasis on a collaborative dialectic process (Plaskoff, 2005), critical discourse (Longino, 2002), or negotiation of meaning (Adger et al., 2004), where teachers use conversation to collectively construct knowledge. What is not emphasized as much in this literature is the role that questions play within these conversations. In the analysis of my findings, asking questions were an important component to the knowledge construction processes, as the teachers used questions to gain knowledge and clarification from other teachers. Questions were triggers used to gain specific tacit knowledge from another teacher and were a vital component of their learning experiences. During the observed PLCs and PD days described in chapter five, teachers would ask questions such as, "Am I doing this right?" "How do you do this?" "How do you assess this?" "How do you cover this topic?" (field notes). These questions were asked to gain an understanding of how another teacher approached a particular curricular outcome and to receive validation that what they were doing was correct or in line with the pedagogical practices of another teacher. The questions prompted the teachers to reflect and make connections to the particular learning task at hand. In answering the questions and resultant conversation, the teachers provided explanations for how or why they were doing something in a particular manner and the teachers would discuss this tacit knowledge. There were opportunities for each of the teachers to reflect upon their individual practices in relation to another teacher's, to receive validation of their teaching practice, and for them to collectively legitimize their knowledge and teaching practices. In this manner, each of the teachers was interpreting and reconstructing the shared information in her own unique way. Biesta and Burbules (2003)

argued, “the only possible construction is a *re*construction” [emphasis in original] (p. 51), and asking questions and carrying out conversations were the ways in which the teachers were able to reconstruct and learn. In these reconstructions, they would assimilate or interiorize the new knowledge. The questions and discussion were important learning opportunities for the teachers.

The teachers’ informal learning processes within this knowledge culture were the mechanisms used to seek tacit knowledge from other teachers, to compare and reflect on their teaching practices, learn from the experiences of other teachers, learn from their personal teaching practices, and ensure they understood what they were learning. They were the mechanisms the teachers used to produce knowledge together and to validate and legitimize their pedagogical practices. As a teacher entered a short-term learning loop, such as when Michelle was collaborating with other Special Needs teachers, she would ask them questions such as, “How do you deal with that? Or, What does *your* daily schedule look like? What do *you* do different?” (first semi-structured interview). The questions of “how” or “why” allowed Michelle to target specific tangents of tacit knowledge that she was hoping to seek from the other teachers. As the other teachers were answering Michelle’s questions, they would be jolted to recall how or why they did something, and the resultant discussion would allow for each of the teachers to reflect upon the information and receive validation on how they organized their programs and for them to collectively discuss various scenarios they had encountered with their students. The questions brought about knowledge in which each teacher could learn and created opportunities for them to come to a consensus and legitimize their practice collectively. Through a comparison of their programs and their past experiences, they were able to co-construct knowledge and then reflect and assimilate individually. This reevaluation of their teaching practices led to methodological changes and improvements.

Teachers' Knowledge Domains

This knowledge culture had a distinctive epistementality in terms of how the teachers envisioned knowledge and their associated heuristic practices. The teachers had a multifaceted knowledge domain and particular ways of managing, producing, and engaging with knowledge. Nerland (2008, 2012) provided four knowledge domains that characterize professional communities: (a) collective way of knowing, (b) accumulation of knowledge, (c) distribution of knowledge, and (d) access and application of knowledge. These knowledge domains were part of the theoretical framework Nerland used in a collaborative study on the professional learning of computer engineers. My study extends these knowledge domains to teachers in a Canadian context and characterizes their unique epistementality and epistemic culture.

Collective way of knowing. The collective way of knowing for the teachers was characterized in how they envisioned and produced knowledge. The participants described their way of knowing as they talked of their teaching practices and shared stories of their learning and teaching experiences (seen in chapter four), and were observed during the PD days and PLC meetings (described in chapter five). Knowledge was generated from, and for, the curriculum and the programs they were teaching, and it was based on information about their students. The teachers had knowledge about a variety of teaching strategies and skills needed to teach concepts and skills to students, and how to incorporate and execute these strategies and skills. They also knew about technology in terms of how to use it and which form to use for their lessons and with their students. Their knowledge was theoretical in terms of the nature of their student behaviour and development, the various assessment practices to draw upon, and curricular knowledge for their courses and programs. The theoretical knowledge the participants used in their classes was constructed from the coursework completed in university and subsequent courses, the textbooks

they had in their classrooms, which were accumulated from university and throughout their careers, information from Internet websites, the curriculum and associated curricular resources they had gained or created, and student information stored in *PowerTeacher* (i.e., IPPs).

The teachers' knowledge was also practically based, where they gained and constructed knowledge through teaching, their teaching practices, and the experiences of experimenting with new ideas or resources. It was also gained from their relationships with students, in terms of information about their students, their actions, and the impact of these on the school community and classroom. Teachers would learn from the instructional techniques they used in terms of which ones worked better than others and how to adapt their techniques and resources to better suit the learning needs of their students. The teachers constructed knowledge with their students and about their students. The theoretical and practical basis of teachers' knowledge formed their tacit knowledge for their work. Knowledge was constructed through a myriad of informal learning processes with their colleagues and students, and from participation in PLCs, workshops/courses, conferences, and PD days.

The participants had different knowledge bases that were specific to the courses they were teaching. Michelle's knowledge base was different from the other participants because she did not have a reliance on a specific curriculum. She would instead use learning outcomes from various courses and grade levels, along with life skills, to create and adapt programs for her students. She would base the development of her programs on her students' individual learning needs and their progress through the material and in her class. Spirit, Ashlee, and Willy had specific provincial curriculums to follow and needed to learn the curricular content in order for them to teach their English classes. They developed their programs, activities, and lessons based on the curriculum and the experiences and resources of colleagues and other teachers; they

would then create or adapt resources to mesh with these requirements. Although the participants had many similarities in the theoretical and practical nature of their tacit knowledge, the intricacies of each subject area required further knowledge specific to the context in terms of students in the class and the course. Each of the teachers had knowledge that was specific to the courses they taught, which enabled them to effectively teach that content to their students.

Accumulation of knowledge. Knowledge accumulation is the extent to which professionals collaboratively or individually gain experiences, and their cumulative nature of adding experiences and information together (Nerland, 2008, 2012). Within this knowledge culture, the teachers accumulated knowledge throughout their careers. It was cumulative as they gained more teaching experience, taught more students, and different courses. The more courses and students they taught, the more knowledge they would have about the course and how to better align course objectives to meet the learning needs of their students. Levine and Marcus (2007) described a progression in teacher informal learning, where teachers would begin with a strong reliance on their colleagues and then progress to mastery, where they function independently and help others. The findings of this study were mostly consistent with this described progression. For example, Ashlee described this progression in her experience of teaching the English course for the first time. Ashlee relied on Willy and the other English teachers to help her learn and maneuver through the course material for the first time and for teaching resources. Ashlee commented that as a new member of the department and to the course, she feels like she does not have much to contribute to their PLC meetings at this point. However, once she teaches the course a few more times, she will be able to contribute more during their PLC time and in sharing resources. Another example was seen in the English *Gradebook* PLC session. Willy and Sheldon had achieved mastery with the *Gradebook* software

and the other teachers relied upon them to learn this new skill. As the teachers progressed in their skill and comfort with the software, they became more independent and were able to help other teachers who were having troubles.

In these and other informal learning activities described in chapters four and five, teachers who were faced with having to learn something new would turn to their colleagues for help. They would turn to a colleague with whom they considered to be a master of the content they needed to learn and who had the experience and necessary knowledge they required. The teachers would ask questions of their colleagues and generate conversation around the task they were learning. In this manner, they were able to elicit tacit knowledge from the master teachers and reflect upon it. This reflection and associated validation, legitimization, and documentation processes that followed would allow the teacher to progress in their skill development and learning. The teachers were able to assimilate new tacit knowledge from their interactions with their colleagues during these informal learning activities.

Where this study evolves understandings about the progression in teacher informal learning is in the cumulative nature of teachers gaining experience and constructing tacit knowledge. Within this knowledge culture, there were teachers at various levels of career development from new teachers to more experienced teachers. A teacher within this knowledge culture was considered to be a master both because of the duration of her career and in the number of times she had taught a course or the proficiency she had with the software. From my analysis, I found that even though a teacher may have lots of teaching experience, she could simultaneously be a novice in her professional learning. At any point in their career, teachers may have to learn something new, teach a new course, or may come across a scenario with a student they have not dealt with before. As such, the progression to mastery was a spiral

evolvement for the teachers within this knowledge culture, where even though they had been teaching for five or more years, when they began to teach a new course, had to learn how to use new software, or were working through a conflict with a student, they became reliant upon their colleagues again for support. They spiraled back from mastery to be a novice again, but soon progressed to mastery after they had taught the course for a few times or became more proficient with the software.

In this progression, the teachers constructed tacit knowledge. This was accumulated through the processes of teaching and participating in conversations with their colleagues either on their own or during PLC or PD sessions. Potentially, the more professional conversations a teacher participated in, the more opportunities there were for him/her to ask questions of other teachers, share knowledge with them, reflect and reevaluate individually and collectively, and learn through their validation and legitimization processes. There were simply more opportunities to construct knowledge. Accumulation of knowledge for the participants occurred through their informal learning processes which created opportunities for them to co-construct knowledge with each other. The informal learning activities provided opportunities for the teachers to progress and spiral in their mastery of skills and pedagogical practices through a reliance on each other. Teacher collaboration was an important part of their learning processes and for achieving mastery in their skills and teaching practice.

Distribution of knowledge. This knowledge domain refers to the dependency professionals have on technology and the written language to distribute or share knowledge within their knowledge culture (Nerland, 2008, 2012). The very nature of teaching involves human interaction in order to distribute knowledge whether through face-to-face communication or through knowledge objects. As seen earlier, human interaction of conversing and asking

questions of each other, are opportunities for teachers to learn from each other through their validation and legitimization processes. Through this interaction, the teachers are able to share tacit knowledge with each other and impact their teaching practices. The distribution of knowledge for teachers also occurs in their classrooms, as they share subject area knowledge with their students and facilitate their learning processes in the course. The participants shared this knowledge with their students throughout their daily classroom lectures and through the resources they provided to the students or had them create.

In all of the observed learning processes, there was also reliance upon written language and technology to distribute knowledge. Communication through electronic forms (i.e., texting, e-mail) helped the participants to share knowledge with other teachers, parents, administrators, and the students themselves. The conversations the teachers had with each other on a daily basis did not always occur in person. The teachers would use e-mail or text messages to ask questions of each other and carry on conversations. Knowledge presented during PD and PLC sessions all involved laptops, Promethean boards, projectors, and PowerPoint's, which showcased the written knowledge teachers were learning or were constructing together. The end constructs of these collaborative sessions were a documentation of their validation and legitimization processes. Documentation within software programs, such as *PowerTeacher*, provided opportunities for the participants to share information about student assessment and behaviour with other teachers, administrators, parents, and their students. Teachers could then use this information to inform their instruction and better meet the learning needs of their students. This documentation of knowledge provided an efficient means of sharing information amongst teachers.

Due to the hectic nature of teaching and teachers not having a lot of time for face-to-face conversations with each other, the teachers in this study relied upon texting and e-mail to

communicate with each other throughout the school day. They also relied upon them for informal learning because as discussed earlier, with their PLC and PD sessions being formalized and prescribed for them, the teachers had to find alternative ways of carrying on conversations to satisfy their learning needs. This was seen when Ashlee would ask questions of Willy through text messaging or e-mail and when Spirit would e-mail other teachers through the website she frequently used. Even though face-to-face communication is preferred, the teachers have evolved their heuristic practices to include the use text messages and e-mails in order for them to carry out conversations, ask questions, and glean specific tacit knowledge from each other. Text messages and e-mails are their attempts at circumventing the formalized structuring of their learning and to adapt to the pressures of their work context. Technology has provided alternative means for the teachers to learn informally from each other, to co-construct knowledge, and then distribute this knowledge.

Access and application of knowledge. Nerland (2008) contended, "the profession-specific patterns of accessing knowledge and ways of handling the relationship between general knowledge advancement and its application in specific work settings are a constitutive dimension in professional knowledge cultures" (pp. 52-53). In this knowledge culture, the participants accessed knowledge through the formalized structuring of the PD days, PLC meetings, and workshops/courses or conferences. They obtained profession-specific knowledge through the sessions at the PD days, where they were learning about various forms of literacy and how to help students develop literacy skills, and through the topics chosen for PLCs. In their PLCs they learned about *Gradebook* and legitimized their assessment practices through the process of creating common exams. The school board and school administration organized the PD days and PLCs according to the current provincial and board policy initiatives, and administrators made

decisions regarding the profession-specific knowledge that teachers would be learning. The participants were also able to access knowledge on their own as they individually prepared to teach their courses through textbooks, websites, or other teaching resources. They collectively accessed knowledge with their colleagues as they participated in PLCs or when a teacher would approach another colleague(s) for help. The teacher's accessed profession-specific knowledge within an organizational structure that had an entanglement of formal and informal learning processes. A vast majority of the teachers' informal learning was formalized and prescribed.

The application of knowledge varied for the participants. Some of the knowledge advancements gained during the PD and PLC sessions were applied in their classrooms. Ashlee, Willy, and Spirit set-up their grade book's during their PLC session and utilized the agreed upon weightings for their formative and summative assessments. However, Willy and Spirit did not apply the knowledge they had gained on the PD Day *Google Docs* session in their classroom. Neither one of them were using the web application in their classes. The knowledge advancements gained from the informal learning processes were applied as was seen when Ashlee used Willy's resources, Willy used the skills she had learned from her Fashion workshop, and Michelle's incorporation of ideas into her program that came from the brainstorming sessions she had with her EAs. The application of knowledge in their teaching practices was highly dependent on the relevancy of the knowledge to their pedagogical requirements and their learning needs. The more relevant the knowledge was to their teaching, the more readily they incorporated and used it. The most valuable learning opportunities were those that involved other teachers within their PLCs or that involved colleagues with whom they had good working relationships. The knowledge constructed in these interactions was specific to the learning needs of the participants and was relevant to the subject area and point of mastery of the teacher. The

informal learning of the participants provided the necessary means and support for accessing and applying the profession-specific knowledge they required.

Summary

The teachers in this study experienced informal learning through knowledge construction processes with their colleagues and students, and involved an entanglement of formal and informal learning processes. They learned informally through a variety of different activities that included learning from the mistakes they made during their daily teaching, in learning a new skill, or in their experimentation with a new resource. The participants' short-term learning loops involved problem solving, brainstorming, and different informal learning processes such as collaboration. The teachers learned from each other and their students in and amongst the constraints of a formalized structure. The exclusionary and inclusionary influences on knowledge within their knowledge culture created discontinuity in the participants' informal learning processes and impacted their heuristic practices of accumulating, distributing, accessing, and applying knowledge. These influences negatively impacted the teachers' professional autonomy and restricted the potency of their informal learning and subsequent evolvement of their teaching and pedagogical practices.

In this chapter, I have explored how the teachers managed and engaged with knowledge and how this influenced their work-based learning. I have provided a more detailed interpretation of the participants' informal learning processes and characterized their knowledge culture in terms of the interdependence between formal and informal learning and the individual and social processes in teacher collaboration, their social construction of knowledge, and their heuristic practices and epistementalities embodied in their community. In the next chapter, I will provide a

reconceptualization of the knowledge culture and discuss the implications of my findings on teacher PD and workplace learning.

Chapter 7 – Reconceptualization and Concluding Thoughts

This study addressed teacher workplace learning and explored teachers' perceptions of their learning within their knowledge culture. Through a combination of two research perspectives, adult education/workplace learning and teacher PD, I gained understandings of how teachers perceived their informal learning, the individual and social processes in teacher workplace learning, the impact of objects, professional relationships, and practices on teacher learning, and the mechanisms they used to co-construct knowledge with their colleagues. This study provides more detailed understandings as to how knowledge is created and transferred between adults and will provide school administrators with knowledge about teacher learning that will enable them to make informed decisions about staff learning opportunities and on where and how to spend their allotted PD budget.

In this final chapter, I will discuss the research question and sub-questions for this study through integration of the analysis, interpretations, and synthesis of the characteristics of the knowledge culture. I will then conclude with a consideration of the implications and recommendations for theory, policy, practice, and future research, and final reflections on the study.

Reconceptualization of Teacher Informal Learning

Knowledge cultures are unique to each profession, as professionals have distinct practices and ways of managing and engaging with knowledge. Their distinctive epistementalities and heuristic practices influence their work-based learning through their documentation, validation, and legitimization processes. These inquiry practices and knowledge relations are central to their collaborative process and are directly involved with the generation of new ideas and knowledge. The participants' knowledge culture consisted of themselves, fellow teachers within their

departments, school, and in online environments, EAs that worked in their classrooms or program, students in their classes, and administrators. The participants, their colleagues, and students also used and produced knowledge objects that were pertinent to their learning. The professional learning of the participants included using their knowledge gained: in university and more recent workshops, PD or conference sessions, from their daily teaching practice and interaction with their students, and their trial and error with new resources or ideas. It also involved utilizing technology to access knowledge (i.e., websites of teaching resources, social media for ideas or support, documentation of collaborative work), working together with their colleagues in their PLCs, and turning to colleagues for help or support.

How does a Teacher Experience Informal Learning?

Within their knowledge culture, teachers experienced informal learning through many different activities and processes. These included trial and error, such as learning by experimenting or through teaching experience and making mistakes, asking questions, sharing information, modeling teaching practices through school-based coaching and mentoring, brainstorming and problem solving, considering one's own teaching practice in comparison to another's, participating in joint work activities, and reflecting. A key finding from my interpretations was that learning from mistakes during experimental or trial and error processes were significant informal learning opportunities for the teachers. As teachers made mistakes in their pedagogical practices, it created opportunities for them to enter a short-term learning loop and reflect on their teaching to figure out what went wrong. Most often, this short-term learning loop would involve asking a colleague(s) for help in brainstorming or problem solving. This was seen when Willy would ask her colleagues at the workshops for help when she could not figure out how to correct a mistake or when she was stuck on a problem. It was also seen when teachers

were learning about *Gradebook* and Google apps. As they made mistakes and had troubles figuring out how to proceed, they would turn to colleagues for help. In each of their short- or long-term learning loops, the participants experienced informal learning and utilized these activities to accumulate, distribute, access, and apply knowledge from, and within, their knowledge culture. The unique aspects of the teachers' short-term learning loops, which involved the collaborative and reflective processes of problem solving and brainstorming rather than a heavy reliance upon knowledge objects, was another significant outcome of this study.

Through all of the informal learning processes and activities, teachers would document, validate, and legitimize knowledge with their colleagues and students. A significant finding in this area was that the teachers learned informally with their students and went through validation and legitimization inquiry processes with them. As teachers spend a majority of their work time with students in their classroom, the questions students would ask, the feedback they would provide on instruction and resources used, and their progression through the course material would inform a teachers' daily teaching practice. As the teachers interacted with their students, they would make changes to their programs and teaching practice to better suit their students' learning needs and the classroom context. The participants' informal learning with their students had a direct impact on their teaching practice.

In terms of the sub-question, how does a teacher perceive her informal learning mechanisms within her professional community, the informal learning activities were the main mechanisms used to co-construct knowledge within their knowledge culture. In their descriptions of learning from and with other teachers, the participants consistently described various informal learning activities. Michelle worked collaboratively with her EAs on a daily basis, Spirit spoke of brainstorming and problem solving with teachers at recess and in parking lots as they came

across each other, Ashlee relied on Willy for advice, knowledge, and teaching resources for her English courses, and Willy really appreciated hands-on learning opportunities where she could experiment with a technique amidst other teachers and then learn from her mistakes and from the advice and knowledge of other teachers.

What is the Impact of Informal Learning Mechanisms on Teaching Practices?

The impact of these informal learning activities and processes on a teacher's teaching practice can be quite significant if it has relevance to their current pedagogical practice and meets a learning need a teacher has. The learning that occurred within the English PLCs was much more impactful for the participants because it had direct relevance to their current needs in their courses, in terms of readily being able to use Gradebook, and there were opportunities for them to come to a consensus on their pedagogical and assessment practices within their classrooms in the creation of common exams. The teachers were able to directly apply what they had learned and co-construct knowledge with other teachers within the context of their workplace. When Michelle implemented the strategies from the Reading Literacy PD session, she found it to be very beneficial to her students and was quite happy with how it worked. She was also excited about having the opportunity to validate and legitimize some of her teaching practices with the leader of this session. The information and ideas she gained from this session were relevant to her teaching practice and she incorporated them into her program. This session and her interactions with the leader met her learning needs.

What is the Interdependence Between Formal and Informal Learning?

The interdependence between formal and informal learning within this knowledge culture was much more significant than originally anticipated and this study provides new and significant understandings of the wider context in which teacher informal learning is occurring.

Teacher informal learning was predominantly entangled with formal learning, and the school district and administrators decided upon the trajectory of teacher knowledge and learning in terms of the content that would be covered in an exclusionary manner. There were significant political, social, and economic effects within the teachers' knowledge culture that were brought about through the formalization processes, and these effects created discontinuity for the participants' professional learning. This discontinuity put adaptive pressure on the teachers to learn informally in other spaces of the school and through electronic forms of communication. Although not ideal, the teachers were finding ways to gain the knowledge they needed and learn from each other in new ways. The infrastructure surrounding teacher learning had an immense impact on their heuristic practices and on how the teachers produced and accumulated knowledge within their knowledge culture.

The significant outcomes of the study in this area were that the prevalent formalization structures that entangled with the participants' informal learning within this context affected their collaborative learning in terms of time restrictions being placed on their PLCs and on the conversations that ensued here and during PD days. The time restrictions limited the amount of professional conversations that occurred and as such limited knowledge construction. These structures also reduced the participants' professional autonomy in the decision making process for what they would be working on in their PLCs and of their learning in terms of having their learning prescribed as opposed to making their own choices to satisfy their learning needs.

What is the Interdependence Between Individual and Social Processes?

Within this knowledge culture, there was interdependence between the individual and social processes in teacher workplace learning. The relationships the participants had established with their colleagues and students were important to their collaborative and informal learning

processes and activities. During a short-term learning loop, a teacher would approach another colleague(s) in order to get help with a particular problem they were trying to solve. The teachers would have a conversation with each other, either face-to-face or electronically, and in this conversation they would ask questions of each other. These questions would elicit specific tangents of tacit knowledge that were particular to the context at hand and that were needed by the teacher in order to solve the problem. As the tacit knowledge was shared, the teachers would validate and legitimize the knowledge. The teachers would then reflect upon the knowledge and assimilate it with their previous knowledge and experiences. This reflective opportunity allowed the teachers to co-construct knowledge through the interactions with their colleagues. The social construction of knowledge for the participants occurred through their informal learning processes, activities, and knowledge objects, as they were validating, legitimizing, and documenting knowledge. In this regard, the impact of professional relationships and practices on teacher learning was immense.

The professional and personal relationships within this knowledge culture were a necessity for knowledge construction. Learning occurred through the relationships the participants had established, particularly relationships that were respectful and trusting. There were personal aspects to these professional relationships, as they shared aspects of their personal lives with each other, which created opportunities for trust to develop and inevitably led to professional conversations and the co-construction of knowledge. The participants tended to gravitate towards the people they were the most comfortable with and trusted, creating more engaging and insightful learning opportunities. This was seen in the working relationship with Ashlee and Willy, Michelle and her EAs, and on PD days when the participants would sit with colleagues they were closer to.

In some of the relationships observed and described in the study, miscommunication, disrespect, a lack of trust, or conflict arose, and this disrupted the participants' learning. In this regard, teachers do not always learn from every colleague within their knowledge culture and they can be selective in terms of whom they turn to for help. Inclusionary influences of trying to learn with other colleagues and sharing in the knowledge construction processes do not always equate to vibrant informal learning opportunities. This was seen when Spirit described her learning experiences and how she went about learning and creating resources for her English courses. She chose an online website as opposed to turning to colleagues within her department. Her learning experiences within this PLC were different than Ashlee and Willy's. The immense impact of professional relationships and practices on teacher learning, particularly in regards to the inclusionary influences on collaboration and knowledge construction, was a significant outcome in this study.

What are the Mechanisms and Tools of a Teachers' Workplace that Facilitate the Co-Construction of Knowledge Between Teachers?

The mechanisms used to facilitate the co-construction of knowledge were the informal learning processes and activities of the teachers, as they would validate, legitimize, and document knowledge. The mechanisms also included their knowledge domain in terms of their collective way of knowing and how the teachers accumulated, distributed, accessed, and applied knowledge within their knowledge culture. This study provides new and significant understandings of these mechanisms and on the impact the formalization structures have on teacher informal learning and knowledge construction. A teacher's knowledge domain consisted of both theoretical and practical knowledge that was accumulated throughout a teacher's career. A teacher progressed in their learning throughout their career where they spiraled back and forth

from being a novice to a master. As teachers gained more teaching experience, taught more students, taught different courses, and carried out more conversations with their colleagues they created more opportunities for learning and building tacit knowledge. The teachers within this knowledge culture distributed knowledge through human interaction and informal learning processes and activities, and through their knowledge objects. Technology, in its many forms (i.e., software, hardware, e-mail, social media, texting), were the main knowledge objects used in this knowledge culture, and through their interaction with and through the technology, the teachers were able to co-construct knowledge with their colleagues and students. The teachers accessed knowledge through their short- and long-term learning loops, and formal and informal learning opportunities. Their application of knowledge gained in these means was based on the relevancy to their current pedagogical practices and learning needs.

The formalization structures of the school board and school greatly impacted the teachers' knowledge domain and informal learning processes and activities. The time constraints of the school day and duration of PLC meetings reduced the amount of time the teachers had to talk with each other and restricted their conversations to pre-determined content. This provision of generic profession-specific knowledge in PD days and determining the content of PLC meetings did not meet the teachers' individual pedagogical needs and did not always have relevance to their teaching practice. This impacted the teachers' professional autonomy because they did not have input into the content of their professional learning or into how much time they wanted to spend learning various concepts. The lack of ownership and autonomy in their professional learning left the teachers feeling frustrated, deficient in their learning needs, and limited in their ability to change and evolve their teaching practices. Of significance then, is that the formalization structures and the inclusionary and exclusionary knowledge influences (i.e.,

time restrictions, lack of ownership, and reduced professional autonomy) lead to discontinuity in the teachers' informal learning processes and activities, and impacted the opportunities the teachers had to progress in their knowledge accumulation.

The school board and school administration in this study managed the teachers' knowledge domain through the manipulation of their informal learning processes. They provided direction on the knowledge content to be learned during PLC and PD sessions, on how knowledge would be distributed and accessed through *PowerTeacher*, and to some extent, the way in which knowledge would be applied. These decisions reduced the professional autonomy of their teachers and impacted the professional learning of the teachers in terms of their desire and motivation to learn. Over time, this reduction of professional autonomy will impact the overall school culture and limit the abilities of this school to access, generate, and apply profession-specific knowledge in support of teacher growth and student achievement.

Reconceptualization of the Knowledge Culture

From my findings and interpretations of how the teachers experienced informal learning within their knowledge culture, the original conceptual framework I proposed in chapter three has changed. The participants' knowledge culture is depicted in Figure 2 and now includes students and more specifically outlines the colleagues (i.e., other teachers, EAs, administrators) the participants were learning with. The informal learning processes and activities were embedded within their knowledge culture and were the mechanisms used to bring about documentation, validation, and legitimization of their knowledge. The knowledge production processes and interactions between the participants, their colleagues, and students were dynamic and fluid, and the formalized structuring of teacher learning did bring about discontinuity to the

participants' learning. Therefore, now included in the knowledge culture is the influence and effect of this formalized structure represented with the oval surrounding the knowledge culture.

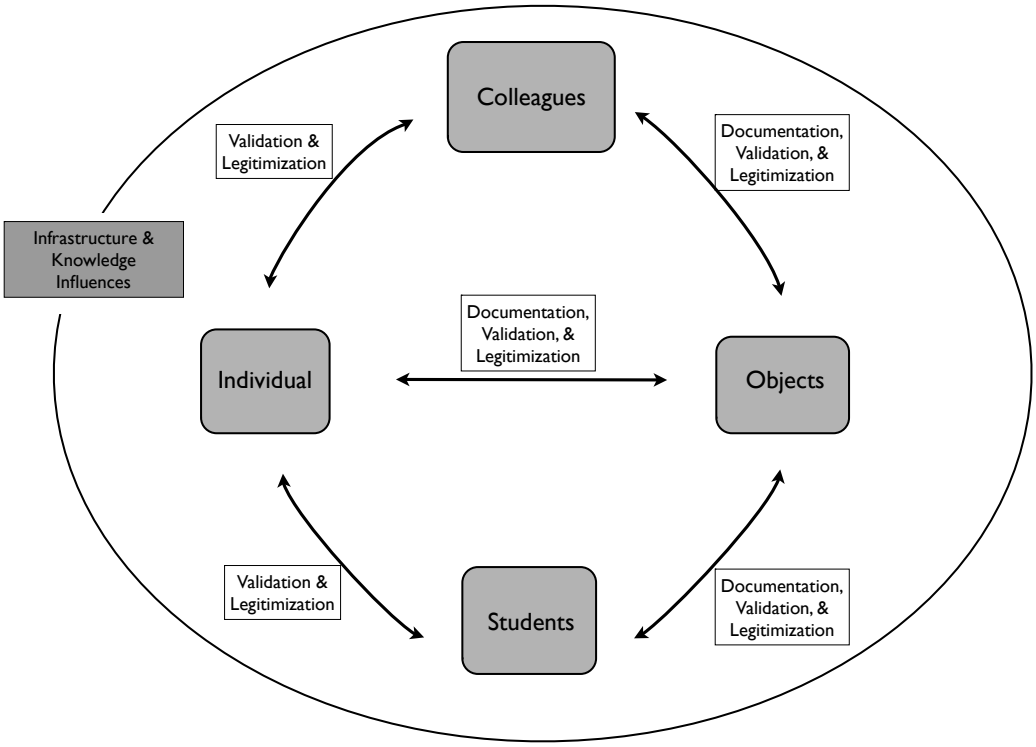

Figure 2. The dynamics of a knowledge culture. This figure illustrates the knowledge production processes through informal learning activities within a knowledge culture.

Reflections on the Research Process

Overall, this research study progressed well and the methods utilized allowed for me to gain a rich data set. From a web search of the Cycle 4 AISI projects, I was able to quickly identify three school boards that equally epitomized teacher informal learning. I sent individual e-mails to the superintendents of the school boards and one of the superintendents granted me permission to contact the principals within the district. One of the principals I had e-mailed agreed to have my study conducted within the school and with the teachers on staff, and provided me with the e-mail addresses for the teachers. Soon after I had sent out my first e-mail

to the staff, I had two participants who expressed interest in being a participant in the study. Following my first meeting with one of those participants, she had provided me with a few different names of teachers, males and females, with whom she thought would be willing to participate if I e-mailed them again individually. I sent each of these teachers an individual and more personalized e-mail and was able to have two more teachers agree to participate in my study. This process of having one participant suggest other participants to contact created a more personal touch and I found this to be more effective than the generic e-mail in recruiting participants.

All of the four participants in this study were female. This was not a part of my research design and resulted from the nature of my participant recruitment method. I did try to recruit male participants through the individualized and more personalized e-mails I sent out, but I did not receive any responses of interest back. Although having an even mix of male and female participants would have been ideal, I do believe the findings of this study are credible, meaningful, and worthwhile. I reflected upon the potential of gender impacting the findings throughout the study, particularly in regards to the theme of relationships and trust within the knowledge culture. However, after looking at the findings, the literature on knowledge cultures, trust, and informal learning, and the reflective discussions I had with my supervisors, the findings of this study are transferable to other contexts, settings, and populations. I do believe differences would be present with male participants, but it can be argued that these differences would be present with any other participant, as each participant would have their own experience with informal learning. However, this study was designed with various data sources and methods to allow for in-depth understandings to be achieved. Although there were differences in the participants' experiences, there were many similarities that led to the themes in the findings and

the interpretations. As such, the multidimensional and holistic nature of my design and interpretive process, allows for the in-depth understandings as to how the teachers experienced informal learning to be applicable to other contexts, settings, and populations.

With each of the four participants having different teaching experiences and teaching assignments, I was able to generate and obtain a vast amount of data. It was wonderful to have three of the participants from the same PLC and made it easier to collect data within a shorter timeframe. I met informally with all of the participants first, except for Willy, and at that initial meeting we set-up a time for the first semi-structured interview. In this initial meeting, I found Michelle and Spirit to be quite excited about my study and were very willing to talk about their learning on their own. This took me by surprise, as I had not anticipated that the participants would talk about professional learning in this regard. As a result, I took a lot of field notes during those initial meetings. I thought the initial meetings went well, and I would repeat this process in my next study. I found this meeting put the participants at ease, and we were able to get to know each other a bit before we sat down for a formal interview. I do believe this was one of the reasons Willy was hesitant at the beginning of the first semi-structured interview; we had not met beforehand and we did not have this pre-established rapport before I interviewed her. However, the PIA helped a lot in this regard, and I found her PIA to be much more informative than the other participants.

Each of the semi-structured interviews occurred in the participants' classrooms and they were at ease in these settings. I was happy with how each of the interviews went and would not change anything from this method. One thing that I learned during these interviews was that each participant did not provide the same depth to their answers. Even though I used the same questions with each participant, the depth of their answers varied. The first semi-structured

interview with Ashlee did not last very long, as she did not provide a lot of depth to her answers. She answered all of my questions without hesitation, but I found I had to probe and ask more questions in order to bring about more background to the stories she had or to get her to share more detail. In reflecting on this first interview and going over the transcripts, I recognized the different parts of her answers where I could have asked her other questions that would potentially have provided even more detail to her responses. I used this reflection to inform how I conducted the second interview with her and asked Ashlee more questions about the information she shared than I did the other participants. In the second interview, I found that Ashlee and I carried out a much more detailed conversation than during our first interview.

Throughout the semi-structured interviews, the participants expressed worry that they did not provide me with enough information for the research study or were worried that they had not answered the questions correctly. I found that I was reassuring them that I was getting enough data and that what they were sharing with me was valuable. Willy was quite cautious at the beginning of her first formal interview and asked many questions surrounding the nature of my research and how the findings would be used. However, at the end of the interview she had commented that the experience was much more positive than she had anticipated and was grateful for having had the time to reflect on her learning.

The observations and informal interviews went very well. I was surprised as to how much information was obtained from the participants during the informal interviews as I had initially anticipated gaining the majority of data from the formal interviews. However, there was a lot of rich data that was obtained from the informal interviews and I spent a fair amount of time after each of these interviews writing down field notes. The conversations following an observation of

classroom instruction or a PLC were valuable opportunities for data collection, and I would plan more of these informal interviews if I were to complete a similar study.

The informal interviews were a rich data set because they provided the participants with the opportunity to reflect upon their professional practices that they had just experienced. As a result of the conversation I had with a participant, I entered into an informal learning experience with each of them which provided opportunities for all of us to grow as professionals. Throughout the data collection process, I established relationships with my participants, developing trust and respect, and became intertwined in their learning processes. I was a learner and a professional colleague who was able to relate, commiserate, understand, and empathize with them through the sharing of my own experiences and oral reflection with the participants. This occurred following a class observation of Willy. As we walked in the hallway towards her next class, she reflected on her lesson with me, and we each shared different anecdotes pertaining to the issue at hand. At the end of our conversation, she shared with me what she was going to change in her next class. In my observation of the *Gradebook* English PLC, I learned new things about *PowerTeacher* when observing the English teachers and in my subsequent conversations with the participants. We each shared tidbits of information on how to use the software program more effectively. During one of their informal interviews and following a semi-structured interview, Michelle and Willy commented that as they were talking with me, they were gaining ideas and appreciated the time to reflect on their professional practices. The formal and informal interviews were another form of professional conversation in which reflection upon tacit knowledge led to new constructions of knowledge between teachers.

There were two particular parts of the data collection that did not go as well as I had originally intended. For their journal entries, I had asked the teachers to write on the professional

learning they would be experiencing throughout the month of September. I provided them with questions to consider throughout the month. When the journal entries were submitted, I found that the participants had either answered only one question or had answered all of the questions in short form. None of the participants provided weekly entries. I was still able to use data from the journal entries but the limited nature of their responses was not what I had expected. If I were to use this method in the future, I would be sure to communicate more effectively my expectations for the frequency of their entries and my collection of them (i.e., recording entries everyday or once a week) and be more cognizant of the time requirements needed to complete the entries. For teachers who are already pressed for time, this method of data collection was not as efficient as the formal and informal interviews.

I had chosen to include a focus group as a method for data collection and was quite excited for this particular element. However, it did not go as I had anticipated. The premise for a focus group discussion was to create a context in which I could observe teacher informal learning amongst the participants through a discussion of some of the main themes I had found throughout my study. It was also an opportunity for me to ask the participants questions that were derived from the formal interviews and applicable to them all. The focus group took place during the teachers' lunch hour, as this was the best time to get everyone together in terms of their teaching schedules and personal lives. I found that much of the conversation went off topic, and I did not end up with a lot of depth in their answers. Although I had anticipated the focus group as being a rich data collection method, I only used a very small part of their conversation in my analysis. The focus group was a great opportunity to have all the participants together, but a lunch hour was not enough time to allow for the conversation to evolve. Michelle did express her appreciation for this method, as it allowed her to hear the perspectives of the other teachers.

In the end, although the discussion in the focus group did not provide me with a lot of data, the reflection on how the focus group went and how the participants were consistent in their thoughts and experiences with professional learning was significant.

Recommendations and Implications

Based on the findings of this study, I am providing recommendations and implications for theory, policy, practice and future research for administrators at district and school levels of management and for policy makers that influence the professional learning of teachers.

Recommendations for Future Research

From the conclusions discussed in chapter six and presented earlier in this chapter, there were questions that arose for me that my study design did not answer and I provide them here for future research consideration. The teachers in this study were lifelong learners and active participants in their school community and PLC. They inherently turned to their colleagues for help and enjoyed learning from and with them. The informal learning the teachers experienced and described in this study were of two forms; one that was formalized and restricted where the teachers worked with other teachers in managed contexts such as their PLC, and another where the teachers on their own would seek out other teachers in unmanaged settings to help them solve a problem or complete a task. As such, this study encourages a consideration of furthering the typology of informal learning to include a "formalized" informal learning and a "natural" informal learning, which better characterizes the nature of informal learning that was previously established as being activities or processes (Eraut, 2004, 2007), and intentional (deliberative) or unintentional (reactive) (Berg & Chyung, 2008; Hodkinson & Hodkinson, 2005). Even though the teachers were carrying out the various informal learning activities and processes that had been identified previously in the literature in each of the suggested typology, the previous terms

do not emphasize or acknowledge the large role formalization structures have on informal learning and the suggested typology highlights this. This proposed typology of formalized informal learning and natural informal learning requires further research to continue deepening understandings of the impact formalization structures are having on teacher informal learning. Future research could explore the necessity for the formalization structures and how formalized informal learning can facilitate learning experiences or how it can lead to natural informal learning.

The inclusionary and exclusionary influences explored in this study also encourage future research to recognize that these influences and factors are present in the workplace and directly impact the work and learning of the professionals. For the teachers in this study, these influences greatly impacted their professional learning and subsequent teaching practices. Future research could consider delving deeper into the exclusionary and inclusionary influences on teacher learning, particularly through a lens that would allow for a more detailed analysis of power within these influences and how it impacts teaching practices and learning.

In terms of policy and practice, future research could contemplate the necessity or need for formalizing teacher learning to the extent it is occurring, in terms of why there is so much formalization, control, and accountability, and why there is a perpetuation of these formalization structures. The irony that came about from this study was that even though teacher PD and learning were being managed to ultimately impact the teaching practices of the teachers, there was actually very little impact that came about from attending district PD days. The most amount of impact came from teachers attending PD of their choosing or from the natural informal learning that occurred within their PLCs or on their own time.

Another area recommended for future research is contemplation of how to generate more autonomy for teachers in their professional learning. In this work, researchers might consider completing a comparative analysis amongst professions in terms of how different professions support and encourage professionals to be autonomous in their professional learning. This research may identify different mechanisms for creating more professional autonomy for teachers in their workplace learning and would progress understandings to support administrators in their knowledge management practices and policy makers in the creation of policies that better support the lifelong learning of teachers.

The research completed in this study was limited to one school and to a small sample size, of which all the participants were female. As such, future research on teacher informal learning could consider mixed methods approaches that would allow for larger sample sizes and multiple research sites. This would allow for the informal learning experiences of teachers to be explored further from elementary schools, junior high schools, and other departments within high schools and to get a more in-depth understanding of the exclusionary and inclusionary influences on the knowledge construction processes of teachers in various teaching contexts. This would allow for the continued exploration of teacher professional learning and PD.

Implications for Theory

This study further explored the informal learning of professionals within their workplace and in particular, brought about better understandings of the informal learning teachers experience in their knowledge culture. There has been much theorizing around the nature of the *informal* in learning and how this manifests for different professionals in different work contexts. The very nature of studying the informal and trying to typify it becomes problematic because you are trying to frame a type of learning that has a spontaneous, elusive, and metacognitive

nature. There have been studies completed that provide typologies of informal learning and differentiation between work processes, learning activities, and learning processes (Eraut, 2004, 2007) and characterization of informal learning activities of teachers (Hoekstra et al., 2009, Wei et al., 2009), along with other studies identified earlier in the literature review (Colley et al., 2003; Livingstone, 2001). The findings from this study furthered the understandings of the formalization of teacher informal learning and leads to the consideration of providing a further typology of informal learning, formalized informal learning and natural informal learning.

The implications of utilizing this suggested typology are that we will have more clarity when using the term informal learning. As it sits right now, informal learning has many conceptualizations and my proposed typologies add to this literature by providing further clarity and understanding. As research continues to progress on teacher learning and PD, the proposed typologies will allow for better understandings of teacher informal learning to come about. Research could be designed to specifically look at the formalized informal learning and the inclusionary and exclusionary knowledge influences, and how policy mandates, such as AISI, are being managed in schools.

Implications for Policy and Practice

Teacher learning is very much formalized and under the control of provincial and district guidelines and financing. As seen in this research study, this formalization has implications on teacher learning, particularly in regards to teachers' professional autonomy. Teachers are restricted to provincial and district initiatives and are not readily encouraged to seek out new initiatives for their schools or individual classrooms. New initiatives, such as policies for assessment practices, are generated from research completed by provincial and district officials and implemented in ways they deem best. In this study, input from teachers was not regularly

sought out to inform this process. The teachers were not encouraged to continually seek professional knowledge from academic sources on their own or to attend conferences outside of the ones put on by their school board or the union (i.e., a national or international academic conference).

Teacher participation in professional communities and PD activities is the mechanism Alberta school boards use to bring about school improvement in terms of increasing student achievement and high school completion rates. The findings from this study encourage district and school administrators to reflect on the role they are personally playing in the formalization of teacher learning in terms of how they are planning and organizing teacher PD and learning, and their knowledge management practices. The understandings from this reflection enables administrators to identify areas in which they could reduce the formalization of teacher learning and create more unmanaged contexts for informal learning to occur. The provision of more unmanaged contexts during the school day for teachers or regularly in their PLCs will provide more time for the teachers to carry out conversations that are pertinent to their learning needs and for them to determine the direction of their knowledge production processes. Providing more unmanaged contexts within the school day will encourage teacher conversations to occur in more professional settings rather than in parking lots or washrooms. The findings from this study also encourage administrators to recognize the extent to which teachers rely upon each other to generate professional knowledge and the importance of having teachers work together to discuss their heuristic practices. This study confirmed that teachers learn from colleagues regularly in their workplaces, particularly colleagues they trust and respect, and are motivated to keep learning because of the necessities generated from their teaching practices and students. As such, school administrators may consider creating more opportunities for teacher interaction, where

teachers have the opportunity to build rapport and trust with teachers within their PLCs and with other staff members. This study provided that organizing district or school PD days where teachers are working outside of their PLCs and trying to learn with people they do not know does not always lead to valuable learning that will impact teaching practices. School administrators are encouraged to further reflect on the various settings that are being provided for teacher PD opportunities and the impact it will have on teacher learning.

Perhaps the most important implication from this study is for administrators to consider is the professional autonomy needs of teachers. This study identified many exclusionary knowledge influences that are challenging the autonomy teachers have in their professional learning. Administrators are encouraged to consider adopting knowledge management practices that regularly and frequently seek feedback from their teachers when planning PLCs or PD days. Teachers could be provided with more opportunities to be active participants in the yearly planning of their PLCs and be encouraged to select more PD of their choosing that may or may not be provided by the district. Being enabled to select and attend PD sessions in a variety of different forms that better support their teaching pedagogy and learning needs, along with having a much stronger and valued voice in the planning of PD/PLC sessions, will increase teacher motivation and autonomy. The findings from this study also encourage administrators to consider the great value informal learning has within the teachers' knowledge culture. As such, when planning for a PD day administrators might consider providing a greater amount of time for teachers to work together under their own means and direction, in which the teachers plan what they will be working on and how that will occur. In this sense, administrators would be creating formalized informal learning opportunities through the provision of the necessary time and context for learning to occur but they would also be creating opportunities for natural

informal learning by not managing what is occurring in that context. Valuing and supporting the informal learning of teachers in more unmanaged contexts would demonstrate a stronger respect for the professional learning needs of teachers and encourage teachers to become more autonomous in their workplace learning.

Concluding Thoughts

Teacher learning is multi-faceted, dynamic, relational, individualistic, and dependent on others. The formalization structures surrounding and entangling with the informal learning processes greatly impact teachers' professional learning and inhibit the potential of this learning and teachers' professional autonomy. This study advanced knowledge and understandings of teacher informal learning and their heuristic practices within their knowledge culture. This new knowledge can be put to work in the professional communities of teachers, engaging the relevant stakeholders in teacher learning and school improvement. The understandings derived from my study will support principals in their administration of their school and staff. It will provide them with better ideas on how teachers learn from each other in their workplace so they can better support and plan teacher PD and learning opportunities. In conclusion, since there is a necessity for and great value of informal learning to teachers' workplace learning, consideration of increasing the professional autonomy of teachers in terms of encouraging and incorporating their voices in the planning and execution of their professional learning, and creating more opportunities for teachers to carry out conversations in more civilized and unmanaged spaces within the school, as opposed to the parking lot or playground, is needed. The creation of more time and contexts for teachers to interact, work, and learn with and from each other during the normal course of a school day, will afford teachers more opportunities for knowledge

construction and for their teaching practice to continue to evolve and progress as their learning needs are better acknowledged and met.

This study added much needed research to the understandings of teacher informal learning through an examination of the existing assumptions surrounding teacher collaboration and learning, and in the investigation of the informal learning processes that were occurring within the participants' knowledge culture. I explored the impact teacher collaboration had on the participants' teaching practice and how the informal learning processes of the teachers were enacted. I also provided better understandings of the impact formalization structures were having on teacher informal learning and the exclusionary and inclusionary influences on their knowledge construction processes. As such, this study illuminated the black box of teacher learning and exposed the dynamics of their knowledge culture.

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Appendix A

Pre-Interview Activities

1. Make a representation of all the different ways you learn as a professional. Using colours, emphasis the processes that have changed the most over time.
2. Think of a particular learning experience you had recently in your teaching. Express in writing or through a drawing where and how the learning occurred.
3. Draw a timeline and on it mark the dates and titles of critical incidents that changed the way you experience or understand learning as a professional teacher.
4. Reflect on your career as a teacher. Illustrate some of things that were difficult and challenging to keep learning about as a teacher. Identify the sources of learning for each and how you overcame them.

Interview Guide for the First Semi-structured Interview

1. Please tell me about the pre-interview activity that you choose.
2. Describe your typical work week.
3. If you could structure your own teaching and work schedule, what would that look like and why?
4. If you had one week off work every month how would you want to use that time?
5. If you could spend 2 weeks with an expert in your field, whom would you choose?
6. Is there something that you have always wanted to do but there has not been enough time or resources?
7. Explain your favourite part of teaching and your least favourite part.
8. Are there some parts of teaching that have become easier? How did you learn to do things differently with those parts?
9. Can you recall learning anything really helpful, exciting or intriguing in the last week, month or year?
10. Tell me about your best learning processes at this time. An example?
11. Is the way that you learn best now different from the way you used to learn?
12. Given what you have learned about your own learning processes, do you wish you had done anything differently earlier in your career?

Appendix B

Observation Table

Knowledge Production	Informal Learning Activities						
	Problem solving	Trying new ideas	Reflection	Inter-Intra-visitation	Analyzing data	Mentoring &/or coaching	Networking
Validation							
Documentation							
Legitimization							

The above is just a sample of the table I will use to guide my observation process. It only shows some of the informal learning activities I will be looking for. During the observations, I will be making notes in each of the boxes as the teacher(s) participates in the particular informal learning activity and how they go about producing knowledge during that activity.

Questions to consider

During my observations, I will be concentrating on:

- The teacher's language used, in terms of what is spoken (professional conversation/dialogue) and unspoken (body language)
- What does her relationship with other teachers look like? How is she interacting with other teachers? How is she engaging in her knowledge culture?
- How does the teacher solve problems?
- When does the teacher reflect? How does she reflect? Did she reach any conclusions?
- How does the teacher feel about trying new things? How does she attempt to try new things?
- What does the teacher glean from student data analysis? Does anything change as a result of this process?
- If the teacher needs help, what does she do?
- How does the teacher help others? How does she teach others?
- How does the teacher characterize how she learns? What does knowledge mean to him/her?
- How does the teacher recover after making mistakes? Does she change things? If so, what did she change and why? If not, what happened?
- How does the teacher deal with conflict, either with students or colleagues?
- How does the teacher get along with others that she does not like?
- How does the teacher get validation within the knowledge culture?
- Is the teacher creating anything for a class? If so, what, why and how?
- How does the knowledge culture go about developing shared practices?
- How does the knowledge culture 'initiate' new members? What is told to the new teachers?
- Do the teachers rely on their own personal experience?
- How do the teachers accumulate knowledge? How do they distribute their knowledge? How do they access knowledge? How do they apply knowledge?

Appendix C

Journal Entries

The journal entries are designed to allow you to share with me stories or experiences you have had as you started up the school year and throughout September. For your journal entries, you are welcome to create a word document, write in a journal or notebook, and include pictures or diagrams. In your journal entries, I would appreciate if you could use these questions as a guide, as you describe your learning experiences during the start-up of the school year, and throughout September. You may include anything else that you feel is relevant or pertinent about the learning you have experienced so far in this school year.

Questions to consider as you reflect on your learning:

1. Describe the learning experiences you have had so far in this school year.
2. Have you learned anything new during this timeframe?
3. Were there any struggles or problems that you have had to overcome in the start-up of the school year? How did you overcome these struggles or solve the problems?
4. What has been most satisfying about the school year so far?
5. Have you had to implement anything new in your classroom (i.e. software programs)? Describe this experience.
6. Were you in a situation where you needed help during this month? Who did you go to or how did you get the help you needed?
7. Describe any mentoring experiences you had this month. Did you help another teacher?
8. Have you worked alongside a teacher or teachers to create resources/exams or generate ideas for your classroom? Please describe this experience.

Appendix D

Michelle's Interview Guide for the Second Semi-Structured Interview

1. Please describe your classroom layout & desk area arrangement. Did you plan the seating arrangement for your students? If so, how do you decide where they sit?

2. From your site visits, how do you document the information you gain? What does this look like? Do you share this documentation with your support staff, orally or written – can they access it on their own? Do they get to change or add to this documentation? What does this process look like if they are able to?

3. Have her describe how she went about solving the whole exam week problem and how it was eventually resolved? Was she happy with the result – did she come to terms with it?

4. You work quite closely with your EAs both on a daily basis and in the planning process. Have there been any conflicts that have arisen between you and one of your EAs, either past or present? How did you resolve this conflict?

5. Ask EAs for feedback from lessons or ideas tried – do you get feedback from students? When students ask questions in class, does this confirm your teaching practice or the way you've chosen to explain or present a lesson? Does your teaching practice change as a result of students asking questions? If so, how? What impact do student questions have on your teaching practice?

6. During my observations, I have found many examples of teachers learning from students. Describe a learning experience you have had with students.

7. From the 1st PD day on literacy (digital literacy), describe their experience of this day – walk me through sessions. Did you incorporate anything from that PD into your classroom/lessons? What did you include? Why did you incorporate that or why did you not? What did you exclude from this day? Why?

8. We have talked in previous conversations about the isolation you experience as a result of your teaching position/specialty. During the 1st PD day, were you able to connect with any other teachers in the district? Do you have other opportunities to connect with them other than at PD days? Explain this if they are.

9. In my last observation, you mentioned that you do not have a curriculum to follow - where do you go when you need to plan for the students? What things do you consider when planning? What does this process look like? How do you find new ideas to try? What do you do if it doesn`t work out?

10. The last time I was in, you shared a story with me of your first years of teaching & how all the theory you had learned from university on classroom management went out the

window. How did you learn to manage students when this theory was no longer applicable? Who did you turn to for help & why?

11. You also mentioned that you thought you might not be cut out for teaching while going through your APT-IPT. What changed your mind or what made you believe that you could do this?

12. In the 2nd PD day, you were a leader at the IPP party – describe this experience. How did it go from your end? Did learn anything new from the other teachers or through leading other teachers? Were you involved in the planning process – to what extent?

13. Describe documentation process for IPPs. Do you talk with other teachers? Is this a necessary component or are you comfortable doing it on your own? Why/why not? Were you comfortable with deleting previous comments/goals? Why or why not? If you could change this process, how would you prefer it to be? Do you use the IPPs on a regular basis in your room? Do you find this process helpful in terms of getting to know a child better – does it inform your teaching practice? Have you made any changes to your teaching approaches as a result of the IPP? If so, what were they?

14. What software did you use before *Power Teacher*? Have IPPs always been done in this manner – how have they changed or stayed the same?

Spirit's Interview Guide for the Second Semi-Structured Interview

1. Have them describe their desk areas and why they have set it up in this way.

2. You're leading conflict resolution at staff meetings - how is this going? Any problems or resistance? If so, how do you overcome this? Explain this to me.

3. Do you ever share any of your personal resources with other teachers on the TES website? If so, what type of resources have you shared? How often? How has this impacted your teaching practice? If it hasn't impacted your teaching practice, why not? If you haven't shared resources, would you ever consider sharing online?

4. Are you mentoring any of the teachers teaching English this year?

5. Last year you had an EA working with you. Can you describe this relationship for me, in terms of how you worked together, planned programs or shared information about/for the child?

6. When students ask questions in class, does this confirm your teaching practice or the way you've chosen to explain or present a lesson? Does your teaching practice change as a result of students asking questions? If so, how? What impact do student questions have on your teaching practice?

7. During my observations, I have noted several times in which teachers are learning from their students. Could you describe a learning experience you have had with students.

8. Do you get input into the context of PD days? District PD days? If you could organize a PD day or all of the PD time for a year, what would you do? How would it be the same or different and why? Are your professional learning needs being met? Is there anything that you feel is missing?

9. During the 1st PD day, were you able to connect with any other teachers in the district? Do you have other opportunities to connect with them other than at PD days? Explain this if they are.

10. From the 1st PD day on literacy (digital literacy), describe their experience of this day – walk me through sessions. Did you incorporate anything from that PD into your classroom/lessons? What did you include? Why did you incorporate that or why did you not? What did you exclude from this day? Why?

11. In the PLC I observed, you were learning how to use *Gradebook*. Were you familiar with this program? How did you find that learning experience of following your DH and using your laptop, along with the others in the room? Would you like to see more of these types of learning experiences or would you change it somehow? Has your competency level increased? Have you seeked out help or helped others since this PLC or during report card time?

12. Did you complete IPPs this year? Do you feel you missed anything from not participating in the IPP party on the 2nd PD day? How do you compile your IPPs? Do you talk with other teachers? Is this a necessary component or are you comfortable doing it on your own? Why/why not? Were you comfortable with deleting previous comments/goals? Why or why not? If you could change this process, how would you prefer it to be? Do you use the IPPs on a regular basis in your room? Do you find this process helpful in terms of getting to know a child better – does it inform your teaching practice? Have you made any changes to your teaching approaches as a result of the IPP? If so, what were they? What software did you use before *Power Teacher*? Have IPPs always been done in this manner – how have they changed or stayed the same?

13. During my last observation, you made mention of wanting to speak with your VP about one of your students, since she had taught him when he was younger. Did you have this conversation with her? How did it go? Did you change anything as a result of this conversation? How are things going with this student now?

14. Journal entry – did you ever express to your principal how you didn't feel supported, in terms of him making an executive decision and not asking you about the number of questions? You made mention of trying to be kinder to each other at work – what does being kinder look like to them. How does this influence the work environment? Does this influence the learning processes? Why or why not?

Ashlee's Interview Guide for the Second Semi-Structured Interview

1. Have them describe their desk areas and why they have set it up in this way.

2. When students ask questions in class, does this confirm your teaching practice or the way you've chosen to explain or present a lesson? Does your teaching practice change as a result of students asking questions? If so, how? What impact do student questions have on your teaching practice?

3. I have observed teachers learning from their students - describe a learning experience you have had with students.

4. Describe your working relationship with the EA that is in your room (what does this look like). Please explain how your work together or share information.

5. If I understand correctly, you are working closely with another participant as you plan/teach English. What does this working relationship look like? How do you work together – how often do you talk? Describe a conversation you have had together or describe a situation in which you had to ask the other teacher for help or advice or a question.

6. Describe your team teaching experience – how do you decide who teaches what, when you teach – any problems that have arisen – how have you overcome them. What do you like best/worst of this experience? What do students think? Would you do this again? Was there a problem you had to solve or overcome - how did you go about this? Did you request to team-teach or how was this decided? Have you team-taught before?

7. You mentioned previously that this is the first time teaching you are teaching English – have you made any mistakes in planning for these classes or in delivering the lessons? If so, what were they and how did you recover? What did you learn from these mistakes?

8. During the 1st PD day, were you able to connect with any other teachers in the district? Do you have other opportunities to connect with them other than at PD days? Explain this if they are.

9. From the 1st PD day on literacy (digital literacy), describe the rest of your experience of this day – walk me through sessions. How did the second session go? Did you incorporate anything from that PD into your classroom/lessons? What did you include? Why did you incorporate that or why did you not? What did you exclude from this day? Why?

10. In observing the 2 PLCs on the first PD day, it seemed that one was more like a department meeting and the other was more focused on learning Power Teacher – would you agree with this observation. How are they different?

11. In the PLC I observed, you were learning how to use *Gradebook*. Were you familiar with this program? How did you find that learning experience of following your DH and using your laptop, along with the others in the room? Would you like to see more of these types of learning experiences or would you change it somehow? Has your competency level increased? Have you seeked out help or helped others since this PLC or during report card time?

12. In the last PD day, you were working on IPPs in the library and you were concerned about deleting information – can you explain to me your discomfort. Were you happy with the resolution? If you could change this process, how would you prefer it to be? Do you use the IPPs on a regular basis in your room? Do you find this process helpful in terms of getting to know a child better – does it inform your teaching practice? Have you made any changes to your teaching approaches as a result of the IPP? If so, what were they? What software did you use before *Power Teacher*? Have IPPs always been done in this manner – how have they changed or stayed the same?

13. Please expand on your statement "I have my own child in child care [so] I feel I am a better teacher and understand more". How so? Describe more of your best moments in English.

Willy's Interview Guide for the Second Semi-Structured Interview

1. Please describe your desk area and why you have set it up in this way

2. I noticed on the bulletin board in the art room, that you have a pinterest area - How do you use this in your classes – is this learning opportunity for you?

3. Does volunteering within the school influence your professional practice? How so? What have you learned so far?

4. When students ask questions in class, does this confirm your teaching practice or the way you've chosen to explain or present a lesson? Does your teaching practice change as a result of students asking questions? If so, how? What impact do student questions have on your teaching practice?

5. I have observed teachers learning from their students - describe a learning experience you have had with students.

6. Describe your working relationship with the EA that is in your room (what does this look like). Please explain how your work together or share information.

7. If I understand correctly, you are helping another participant with planning/teaching English, as this is the first time for her. What does this working relationship look like? How do you work together – how often do you talk? Describe a conversation you have

had together or describe a situation in which you had to ask the other teacher for help or advice or a question.

8. You mentioned previously that you have only been teaching English for 2 years: Have you made any mistakes in planning for these classes or in delivering the lessons? If so what were they and how did you recover? What did you learn from these mistakes?

9. During the 1st PD day, were you able to connect with any other teachers in the district? Do you have other opportunities to connect with them other than at PD days? Explain this if they are.

10. From the 1st PD day on literacy (digital literacy), describe your experience of this day – walk me through sessions. Did you incorporate anything from that PD into your classroom/lessons? What did you include? Why did you incorporate that or why did you not? What did you exclude from this day? Why?

11. In observing the 2 PLCs on the first PD day, it seemed that one was more like a department meeting and the other was more focused on learning Power Teacher – would you agree with this observation. How are they different?

12. In the PLC I observed, you were learning how to use *Gradebook*. Were you familiar with this program? How did you find that learning experience of following your DH and using your laptop, along with the others in the room? Would you like to see more of these types of learning experiences or would you change it somehow? Has your competency level increased? Have you seeked out help or helped others since this PLC or during report card time?

13. In the last PD day, you were working on IPPs in the library and there was concern about deleting information – were you concerned? Were you happy with the resolution? If you could change this process, how would you prefer it to be? Do you use the IPPs on a regular basis in your room? Do you find this process helpful in terms of getting to know a child better – does it inform your teaching practice? Have you made any changes to your teaching approaches as a result of the IPP? If so, what were they? What software did you use before *Power Teacher*? Have IPPs always been done in this manner – how have they changed or stayed the same?

14. During the IPP party, you had a conversation with Thomas. The conversation started with you being uncertain about having the necessary knowledge to write an IPP for a student that had a particular disability/disorder. Thomas told you to trust your professional judgment because you did know this child – did you feel empowered from this conversation? Did you make you feel more comfortable to complete this IPP? Did you feel that you could trust yourself more?

15. When I was in last, you made mention of an art PD that you had gone to and said that you did not like it. Do you remember why you didn't like it? What would you change?

Appendix E

Focus Group Questions

1. Describe your school. How big is it in comparison to other schools in the district? What is the school known for?

2. Trust was a resounding theme throughout my observations and informal discussions. Explain to me how important trust is to you as a professional and how this influences your learning at work.

3. Where does most of your socialization with other teachers occur? Staff room? Department office? What draws you to this area? Coffee/food? How often do you frequent these areas?

4. How do you overcome the isolation of this job and the obstacles this presents? In relation to learning? Has electronic communication (i.e., e-mail, texting, putting notes on *Power Teacher*) helped alleviate some of the isolation or has it furthered it?

5. Do you get input into the context of PD days? District PD days? If you could organize a PD day or all of the PD time for a year, what would you do? How would it be the same or different and why? Are your professional learning needs being met? Is there anything that you feel is missing?