Literature Review and Research Proposal

The Study of an Online Professional Development Lesson Study Community of Practice for Teachers Using Web 2.0 Tools

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Literature Review

Introduction

This literature review is intended to inform the development and study of an online Lesson Study (LS) community of practice (CoP) that can nurture deep reflective interactions that support teacher reform using 'anytime, anyplace' web 2.0 tools. When analyzing the research literature to include in this review, certain overarching questions were used to determine relevance:

What are the best practices for developing a socially interconnected community?

What practices encourage deep reflective interactions that lead to reforms in teacher's thinking and practice?

What are the best technologies for sharing resources and communication?

Within this review, I analyzed the relevance of the research findings and their implications for the development and management of a successful online lesson study community.

In searching through the literature, I noticed that there appears to be a marked scarcity of quantitative or causal research in the areas of online teacher CoP, teacher professional development (PD), and LS, however, I was able to find many case studies referring to the implementation and design of teacher PD, online teacher CoPs and online tools for collaboration. Although these case studies provide a rich and contextual account of these phenomenon, their suggestions for practice within a particular experience may not be generalizable to other related situations.

With this in mind, I have utilized the following literature review to gain insight into the design and implementation of various structures contained with my research area. However, I understand that they do not provide sufficient evidence to focus my study upon a single hypothesis or set of variables and therefore will not limit my investigation of online LS CoPs.

Teacher Professional Development

In the last 20 years, there has been limited research that has linked teacher PD to student achievement, of which very few studies are statistically significant or offer the scope to enable conclusions to be drawn on best practice in the design of PD models (Yoon, Duncan, Lee, Scarloss, & Shapley (2007). This makes it difficult to find resources that would suggest that the practices of LS are cohesive with best practices in teacher PD. Even more troublesome is the lack of research on LS despite its growing popularity (Lewis, Perry, & Friedkin, 2009).

One study, by Garet, Porter, Desimone, Birman, and Yoon (2001), analyzed the effect of certain features of PD on teachers' learning and teaching practices in a large scale survey of teachers' professional development experiences. They noticed slightly enhanced teacher perceived knowledge and skill improvement in reform activities, though they thought it was likely due to duration, content focus and active learning. In fact, there were strong correlations between both content and pedagogical content knowledge and teachers' perceived increase in knowledge and skills. Coherence of PD activities, consistency with past and present teacher professional knowledge and contribution to continuing communication among teachers, was also significantly correlated with increased knowledge and skills. Although less significant, active learning, including observing and being observed, collaborative and reflective classroom planning and implementation, reviewing student work, and presenting, leading or writing about the

learning process, also positively correlated with increased knowledge and skills. Finally, changes in teachers' practices had a strong correlation with increased knowledge and skills and coherence of PD. One of the major flaws in this study was its reliance on PD funded by the Eisenhower Professional Development Program likely resulting in the exclusion of unfunded, ongoing, school or district based teacher-led PD initiatives which may have altered the above correlations.

Case in point, Lewis (2009) identified a process called lesson study, a teacher-led form of action study, that consists of similar characteristics as describe by Garet et al. (2001) that were associated with improved teacher knowledge and skills. In her study, LS is described as consisting of iterations of improvement in which teachers collaborate to: formulate goals for student learning and growth, plan a lesson to achieve these goals, observe or are observed during its implementation, gather and review evidence of student thinking and work, reflect upon the lesson within the group, revise, repeat and share findings with members outside of the group. Within this case study consisting of three groups of Japanese elementary teachers performing LS, Lewis recognized three different types of knowledge developed by the participating teachers during lesson study: development of content and pedagogical content knowledge; development of interpersonal knowledge through collaboration within collegial relationships; and development of knowledge and interest in inquiry and reflective approaches. Lewis (2009) also noticed that teachers practice of LS and development of interpersonal relationships increased their ownership of pedagogical methods, responsibility to one another`s development, and learning specific to the process. However, the researcher warns that success of a lesson study cycle could hinge less on improving content knowledge or student achievement, but on a design that inspires teachers to continue within the process.

Issues with this study arise from the lack of methodology of design or analysis, however, due to the lack of research in this area, I felt that it provided insight into LS as a PD method and its relation to best practices identified in Garet et al. (2001).

Online Communities of Practice

The PD literature suggests that collaboration is important which may explain the expansion of PD into CoPs, by definition, consisting of shared repertoire, joint endeavor and mutual participation (Carr & Chambers, 2006; Shulman & Shulman, 2004). Therefore, it is reasonable to speculate that the development of teacher CoPs within online environments may offer many advantages for supporting continuous and collaborative teacher professional development. With anytime, anywhere affordances of new web 2.0 synchronous and asynchronous communication tools, teachers are able to participate outside of time and place constraints common in face-to-face meetings (Carr & Chambers, 2006).

The following three case studies provide an extensive evaluation of three online communities using the analysis process of interviews, observations and interactions. Although unrestrained and failing to measure direct evidence pertaining to concrete changes in practice or student learning, this developmental research provides insight into variables that should be confronted and balanced when designing future teacher PD CoP models.

In the following study, three different project directors analyzed interviews, observations, surveys, student work, and online dialogue from two separate projects focused on studying the connections between teachers' participation in a PD CoP and teachers' content pedagogy knowledge. From this analysis, Rodrigues concluded that changes in pedagogical content knowledge and practice were due to six key factors:

Direct relevance to their classroom suggested increased ownership of the PD and reflective practice;

Recognition from peers, pupils and parents led to increased confidence, motivation, reflection and risk taking;

High quality resources including long collaborative periods with peers encouraged reflection;

Reflective dialogue increased when encouraged to share thinking on and in action during "show and tell" sessions of lessons implemented;

Readiness, the ability of teachers to be open-minded and seek change, increased when the teachers felt supported within shared initiatives with peers;

And risk, whether in adopting new practices or sharing personal experiences, increased when peers shared the responsibility to take risks and it became the norm.

Whether during face-to-face or online interactions, research seems to suggest that authentic, relevant and collaborative activities of sufficient duration may encourage more reflective practices and changes in content pedagogical thinking, knowledge and skills.

Baek and Barab (2005) studied a well-funded and extensive online voluntary CoP for teacher's PD called the Inquiry Learning Forum (ILF). Using the grounded theory approach to analyze documents, interviews, and observations over a three year design phase, the researchers were able to identify and study 5 emergent design dualities, in other words, the dynamic tensions between teachers and designers during the co-creation of an online CoP. The goal of this re-

search was to inform future researchers and designers on the best practices of online PD CoP design in order to both maximize their full potential and minimize potential issues that may undermine their utility or participation. During the development stage, all involved recognized the need to develop "with" rather than "for" the participants. This was never more evident when teacher`s advocated for "Inquiry Circles", consisting of small private work spaces for groups to practice LS, largely due to teachers need to develop a private intimate space where they could meet to work on areas of direct relevance to their needs. Within these spaces, teachers and researchers believed that they would be able to build trust and support through cooperation in joint study, gain the confidence to openly share problems, and develop the culture to critique each other's ideas and engage in collaborative reflection. However, in their haste to respond to the needs of the inquiry circles for communication and lesson sharing functions, the developers sacrificed usability for functionality leading to a steep learning curve and frustration among users. Amazingly, these issues did not lead to an exodus, but rather strengthened the community because they were able to work within the sites support system to collaboratively find solutions.

The site also evolved to offer other support, such as in-group and in-site facilitators, out of a need to assist and develop a sense of community. In conclusion, it was the active engagement and negotiation amongst the community's members in co-construction that seemed to produce a useable product. Diminishing the strength of their argument, I noticed that there was a lack of investigation into whether the reflective dialogue improved within the smaller lesson study groups compared to the main site.

Although the IFL program discussed the development of the "Inquiry Circles" as part of their CoP, I was unable to find subsequent studies that described the dynamics within these

online private communities suggesting a need for further research to understand the interactions and changes within these small LS groups. One question might be, where the groups able to develop the foundations, such as support and trust, needed to engage in critical and reflective dialogue, and if so, how?

Correspondingly, Carr and Chambers (2006) identify similar conditions to the previous two studies that facilitate or deter professional learning in online environments. Despite low participation within the site, the authors concluded from interviews that teachers appreciated the 'anytime, anyplace' affordance of the online environment and praised the potential of this model. The researchers also underlined the importance of communicating a clear shared purpose and expected benefits, establishing smaller focus groups inside the community, developing shared critical reflective practices, inspiring willingness to take risk, including of a facilitator to give timely technical and intellectual support and to build trust and belonging, providing face-to-face meetings to develop bonds, increasing familiarity with online communication tools, and ensuring reasonable usability and centralization of communication tools.

Collaborative Web 2.0 Tools

There appears to be substantial amounts of research on effective use of collaborative technology tools consisting of chat, forum and wiki functions for communication and collaborative construction of artifacts and knowledge. Similar tools exist in the web 2.0 cloud providing teachers and researchers with free, user-friendly interactive tools in which to build online CoPs.

Chen, Chen & Tsai (2009) found that the chat function can provide the real time "human touch" needed to build personal relationships within a community but was less effective for reflective dialogue. Whereas Kelly, Gale, Wheeler & Tucker (2007) found the forum function

supported more reflective thinking by giving more time to think before participating. Similarly, the wiki function provided an effective reflection and collaboration tool (Hutchison & Colwell, 2011)

Although not a web 2.0 tool, literature on video analysis, as part of an online teacher PD CoP, was also analyzed as it would be important for teachers when analyzing the implemented classroom lesson as a part of LS. Hauge and Norene (2009) found video analysis led to deep reflection through discussion of pedagogy embedded in authentic classroom practices.

Conclusion

Based on the findings of all eight articles, I believe there is indirect evidence to suggest that an online teacher LS CoPs using web 2.0 tools could provide an effective collaborative platform for building a shared community of reflective practice. However, further research is needed to convincingly prove that these findings would be applicable to a successful online LS CoP. Due the lack of definitive conclusions within the literature to inform theory, I believe that research in this area needs to focus on a holistic approach before it is able to focus on specific areas of inquiry within this model.

Proposal

Introduction

"If we knew what we were doing, it wouldn't be called research, would it?" Albert Einstein

The traditional and dominant form of professional development (PD) that still exists today is the short-term transmissive model consisting of day workshops and seminars (Richardson, 2003). Yet, these transmissive models are often in conflict with authentic situations within teachers' classrooms or schools and provide minimal opportunity for conversation, collaboration or feedback and no on-going support (Richardson, 2003).

Based on the research that collaboration is important to teacher PD, new PD is expanding into communities of practice (CoP) that provide teachers an opportunity to collaborative in a community of shared repertoire, joint endeavor, and mutual and collaborative participation (Shulman & Shulman, 2004). Whether structured or voluntary, a CoP provides one of the most effective forms of teacher professional learning, the opportunity to share personal experiences and reflect on practices with like-minded peers (Carr & Chambers, 2006), similar to the job-embedded cooperative inquiry approach called lesson study (LS). As a trained facilitator and practitioner of LS, I believe that it provides valuable opportunities for teachers to extend their normal investigations from their individual practices to more formal and collaborative processes for investigation of those same practices. Through this process, teachers become action researchers who collaborate to find answers to best practices in teaching and learning within authentic and contextual environments.

One practice that shows promise for LS is the development of an online CoP. Online CoPs offer many advantages for supporting continuous and collaborative teacher PD. With 'any-

time, anywhere' affordances of the web, teachers are able to participate outside of time and place constraints and therefore enjoy greater flexibility and increased opportunities to process ideas and reflect on practices (Carr & Chambers, 2006).

Within an online environment, synchronous and asynchronous web 2.0 tools may provide an inexpensive and unique approach to creating small teacher LS CoPs. In particular, Eduwiki and Google Docs provide online collaborative platforms, each complemented by a forum and a chat tool, respectively, providing many valuable collaborative affordances.

Although the research points to the potential benefits of creating this community, it also indicates that creation and sustainability require the consideration of many factors. Nonetheless, I propose to establish and support a small LS CoP utilizing web 2.0 tools which are designed and implemented with the best practice approaches described in the research contained in the literature review. In this online environment, the practice of LS will be facilitated as an informal course consisting of planned stages utilizing applicable web 2.0 tools appropriate to the purpose of the interactions. The facilitator will act to guide the process, socially, intellectually and organizationally, without taking away the participant teachers self-determination of the activity and interactions.

Questions to Explore in the Study

What kind of interactions between objects, facilitator or participating teachers can be established in an online lesson study CoP?

What changes as the lesson study community progresses through the stages of online lesson study? and

What are the perceptions of the facilitator and the participating teachers regarding the outcomes of the online lesson study CoP?

Literature Review

Professional Development

Garet, Porter, Desimone, Birman, and Yoon (2001) proposed that effective teacher professional development should be long in duration, involve teacher collaboration, active learning, development of content and content pedagogical knowledge, and have coherence with participants existing theories, practices, and goals. Similar studies have further indicated that PD should be anchored in relevant and authentic activities, consist of shared goals, and provide the assistance of a facilitator (Richardson, 2003).

Comprising similar features described in Garet et al. (2001), LS involves the collaboration of a small group of teachers within an authentic and contextual action study. Within this study, teachers created a working model of teaching and learning leading to development of content and pedagogical content knowledge coherent with shared overarching goals (Lewis, 2009). Because of the lack of research in lesson study (Lewis, Perry, & Friedkin, 2009), I believe it is reasonable to consider lesson study to be like a small CoP, a group of people collaboratively working toward a common goal using shared resources for research purposes (Shulman & Shulman, 2004).

Online Community of Practice

Research on online CoP suggest that teachers preferred to belong to intimate focus groups engaged in active, reflective, relevant and shared activity with clear goals and benefits (Baek & Barab, 2005; Carr & Chambers, 2006; Rodrigues, 2006). Other conditions that appeared to facilitate online professional learning are facilitators, usability of the environment and centralization of communication tools (Baek et al., 2006; Carr & Chambers, 2006).

Web 2.0 Tools

Research on effective use of different technologies for communication and co-construction of knowledge suggested some essential factors. First, a chat function, consisting of real time online texting, was important in providing teachers with an informal live tool that enabled them to build personal relationships within the community (Chen, Chen & Tsai, 2009). Second, a forum function, consisting of online threaded discussions, was found to support more reflective thinking because of more time to think before participating (Kelly, Gale, Wheeler & Tucker, 2007). Third, the wiki function, consisting of communal and editable webpages, was found to provide an effective tool for reflection and collaboration on practice, but may be an even more effective tool for co-construction of artifacts (Hutchison & Colwell, 2011). Finally, video, although not an online tool, enabled teachers to engage in deep reflective analysis through discussion of pedagogy practices embedded in authentic classroom situations (Hauge & Norenes, 2009).

Rationale for the Study

The framework of this study is based upon the ontological assumption that reality is relative, there are multiple understandings of reality and these change through social negotiations and co-construction (Gale, 1993). Based on the socially interactive core of the research, a constructivist or naturalist inquiry model appears to be best suited to the investigation of the research questions (Agostinho, 2005). The naturalistic inquiry model's five axioms (Lincoln & Guba, cited in Agostinho, 2005) correspond with the properties of this research as follows: Reality is only understood from a holistic perspective of the context-rich and authentic online CoP; The researcher takes on a reciprocal influence over the objects as both a facilitator and participant; The research is attempting to provide understanding of how this model functions and what variable interactions show promise for further investigation; The studies interest is in simply identify-

ing simultaneous interactions between variables that suggest possible themes rather than studying causal links; The values of the inquirer are embedded in the inquiry purpose, setting, and the community's action research method.

The lack of research in practices and methods of LS, in particular online LS, indicate a need for research in practices within online LS CoPs that focus on what occurs in these environments and how these relationships might inform future research on best practices in design and implementation (Lewis et al., 2009). In this research, the use of a naturalistic case study framework is utilized to study the interactions and stages of growth in the community, to document the online lesson study process, and to investigate the effects of various strategies, such as the use of a facilitator on the interactions and perceptions within the community.

The Site and Sample Selection

The participants in this study will consist of 6 high school public school teachers who are currently teaching Grades 10-12 Mathematics in the central Okanagan district. The 6 teachers will consist mainly of past participants of face-to-face LS groups from an ongoing Central British Columbia professional development initiative. The reasons for choosing this sample are that the participants are already familiar with LS and myself and therefore may be more easily convinced to participate. Although I recognize that selecting a sample of individuals that may be familiar with each other and the LS process may decrease the generalizability of the study, I believe that these factors will also improve the success of the community and decrease variables that may inhibit participation, such as trust and coherence of professional goals within the CoP.

As the researcher, I will also be taking on the role of facilitator and will be responsible for facilitating the online course. As a formally trained lesson study facilitator, I can provide ap-

propriate guidance. And as a researcher, I will be able to adjust the process of events based on ongoing feedback from participants.

The Researcher's Role

In order to get approval for the research, I will be submitting a request to the school district in which the teachers are currently employed. As a participant, trained facilitator, and well-known and respected member within the LS initiative in the district, I predict a favorable response as it flows from the present initiative. A consent letter will be sent to all participants to ensure that they are familiar with the study's rationale and strategies, and their right to anonymity and withdrawal from the study at any time. In addition to getting consent from the participants, the students within the implementation class will also have to their consent to be video recorded for study purposes. For ethical and privacy reasons, I will mail video copies of the classroom lesson to all participants rather than upload them to a video hosting site. All online web 2.0 tools utilized in the community will also be private to the research group.

Data Collection Methods

The dominant data collection technique will be participants' online text contributions as this is the largest source of data and will inform the research questions pertaining to interactions between participants and changes related to the progression of the lesson study stages. Email interviews containing 4-6 open-ended questions that allow for variations (Gay, Mills, & Airasian, 2009) will provide information on teachers' perceptions and feedback at each stage of the lesson study cycle. An online documented history of each participant's contributions to co-constructed artifacts such as lesson plans will provide further detail of participant interactions. My own perceptions as a facilitator and researcher will be documented in a reflexive journal which will in-

clude a detailed chronological ‘thick’ description of the study, my perceptions throughout the study and a chronicle of my evolving ideas and theories during the research process.

Data Analysis Strategies

Over the course of approximately one year, the data will be collected and investigated after each stage of the lesson study cycle for obvious themes and issues that may inform practices. As the study’s main source of data, the text-based online communication will be studied using content analysis in order to categorize and analyze the text. Based on the framework of Chen et al. (2006) which was revised from Henri’s original model (Henri, cited in Chen et al., 2006), the text will be coded four times into four different dimensions: participation, social cues, interaction types, and cognitive and metacogntive skills. Email interviews, artifacts and detailed field data will be analyzed using data abstraction and coding into themes and categories (Gay, Mills, & Airasian, 2009)

Trustworthiness of the findings will be demonstrated through the use of triangulation of data, prolonged and close engagement in the study, persistent observation and thick description, an audit trail and informal member checks to ensure findings match participants’ perceptions.

Potential Contributions and Limitations of the Research

This study is important because of its aim to create a flexible environment that incorporates teachers’ understandings, practices and opinions into professional development by creating an experiential, collaborative and authentic context for ongoing reflection on teachers’ practices. Hopefully, this research will give a description of a working model of an online lesson study CoP, provide themes related to best practice, and inform future research on online LS CoPs.

Since the study is small, any more than two withdrawals from the study will result in failure of the community to function as a LS group making the study invalid. In addition, sick-

ness or other issues that could affect my ability to act as a facilitator would also undermine the validity of the research. Finally, any issues related to the web 2.0 tools, such as going offline, could jeopardize the research. However, daily recording of data and backup tools may control for such a disruption.

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