Teacher Professional Development Online: An Annotated Bibliography


Abstract: This article described the experiences of an inservice professional development program for teachers with a focus on online synchronous discussions. Transcripts of six online synchronous discussions containing 3600 messages from an online teacher professional development course were analyzed. In addition, the researchers interviewed 10 participating teachers in order to understand their perceptions toward online synchronous discussions. According to the online discourse data, the online synchronous discussions served not only as a learning tool, but also an avenue for teachers to request and provide information, socialize and support each other. The analyses also revealed that the teachers posted more social messages in the beginning and the end of discussion, and most messages did not involve any cognitive and metacognitive skills. Moreover, the interview results showed that the information exchange during online synchronous discussion was not effective for some participating teachers. Based on the interview data, synchronous discussions appeared to hold little advantage when compared to face-to-face discussions for several participating teachers that we interviewed. The problem may be resulted from lack of self-regulated skills by the participants or from the role played by the moderator.
Relevant Quotations:

- “Online professional development (OPD) provides Internet-based learning opportunities, including educational courses, activities, work-shops, resources, and online interactions with instructors, mentors, and colleagues (Treacy, Kleiman, & Peterson, 2002). Online professional development provides opportunities to participate in professional development activities that might not be offered locally.” (p.1155).

- “Online teacher professional development offers educators an alternative opportunity for professional development. It also could overcome the obstacles such as the large geographical area and the increase in transportation problems. Moreover, OTPD makes anytime, any-place professional development available to educators by using a range of digital resources to enhance the pedagogy of teaching (King & Dunham, 2005; Ryan & Scott, 2008).” (p.1156)

- “Along with its potential benefits, OTPD has certain challenges to its implementation and effective use. OTPD can be “richly interactive, in that it can give participants multiple opportunities to reflect on issues and questions (National Academy of Sciences, 2007, p. 4).” Nevertheless, obstacles to OTPD have been documented. First, although online courses offer teachers a way to read, reflect and discuss with other colleagues, OTPD requires that time be made available in teachers’ schedules.” (p.1156).

- “A growing body of literature has explored the connectivity between technology and collaborative learning by using dialogue as a pedagogical tool to help students engage in online synchronous discussion for idea exchange (Duemer et al., 2002; Hsu, 2004; Shotsberger, 2000). Current research primarily focuses on evaluative case study results of
videoconferencing (Locatis et al., 2003), university course (Dickey, 2003) and TPD program (Shotsberger, 2000). Research has shown that the synchronous text chat is useful for holding virtual office hours, team decision-making, and community building (Branon & Essex, 2001).” (P.1156).

**Learning Theories from the Article:**

This article mentions social constructivist theory. The quote below describes this:

“From a sociocultural constructivist perspective of learning (Vygotsky, 1962), dialogic interactions between students and tutors are crucial for supporting negotiation of meaning that leads to knowledge construction. In online educational contexts, engagement between learning parties is largely facilitated by computer-mediated communication (CMC) technologies such as e-mail, chat rooms and discussion forums.” (p.1156).

They discuss collaboration as being important so that would lead me to say that social constructivist theory would play a role.

**Future Research Questions Based on Article:**

**My question follow up questions would be:**

1. In what ways does familiarity with online discussion impact oTPD?
2. In what ways does the addition of a synchronous component impact teacher’s perceptions of oTPD?


**Abstract:** Teacher Professional Development (TPD) is critical for educational improvement in higher education. However, one of the main concerns in TPD is that the traditional workshop
format constrains active participation and the consequent creation of usable knowledge for teaching. In response to this challenge, we developed a series of teacher-centred online Teacher Professional Development (oTPD) programmes using a problem-based learning approach. We created opportunities for participants to engage in the oTPD programmes and to construct usable knowledge that could be immediately applied in their own class contexts. The study presents examples of oTPD, findings, and lessons learned for successful implementation of teacher-centred oTPD programs in higher education. This study will be particularly beneficial to the practitioners who plan to implement oTPD programs for university teachers.

Relevant Quotations:

• “However, one of the main concerns reported in many TPD programmes is teachers’ lack of active participation (Dede et al., 2009; Looi et al., 2008). In traditional TPD programmes, it is not uncommon to see one facilitator or lecturer leading an entire group of people, with limited opportunities for participants to interact with others, and delivering uncontextualized knowledge” (P.144).

• “Problem-based learning refers to ‘a way of constructing and teaching courses using problems as the stimulus and focus for student activity’ (Boud & Feletti, 1997, p. 2). Problem-based learning is an umbrella term that is widely used to cover innovative and pedagogical methods, using problems as a main catalyst for teaching and learning practices such as project-based learning (Krajcik & Blumenfeld, 2006), goal-based
scenarios (Schank, Berman, & Macpherson, 1999) and constructivist learning environments (Jonassen, 1999).

• “The data analysis results showed the oTPD programmes provided opportunities for university teachers to actively participate in TPD programmes as well as to create usable knowledge immediately be used for their own teaching contexts. However, at the same time, for the successful implementation of oTPD programmes, clear communication about the ways of operating oTPD and expectations as well as facilitator’s active role are significant” (p.155).

**Learning Theories from the Article:**

This article makes no mention of theory but mentions cognition:

“Cognitive tools refer to intellectual devices that are designed to help learners represent, organise and process projects (Jonassen, 1999). Cognitive tools help learners represent what they know and what they are learning as well as help learners gather necessary information to complete the task/project (Jonassen, 1999; Krajcik & Blumenfeld, 2006)” (p.146).

They discuss collaboration as being important so that would lead me to say that social constructivist theory would play a role.

**Future Research Questions Based on Article:**

**My question follow up questions would be:**

1. In what ways time required impact participation in TPD?

2. In what ways does the online delivery impact the TPD?

Relevant Quotations:

- “Real patient contacts early in medical education, i.e., in the preclinical phase, have been advocated for several reasons. They are assumed to ease the transition from preclinical to clinical training (Prince et al. 2000; Seabrook 2004), motivate students to learn (Prince et al. 2000), and help them forge their professional identity (O’Brien et al. 2001; Pitkala and Mantyranta 2003). Students have been reported to feel more comfortable performing physical examination (O’Brien et al. 2001) and be more aware of the impact of illness on patients (Cooper et al. 2001; Frank et al. 1996) as a result of seeing real patients” (p.634).

- “Reported positive effects also include improved acquisition and retention of knowledge (Prince et al. 2000; Seabrook 2004) and contextualisation of basic science knowledge (O’Brien et al. 2001; Mann 1994) by linking real patients with theory” (p.634).

- “Taking part in a real consultation with a real patient is a strong incentive for students to prepare for the contact. They are keen to avoid failure in front of a patient and take the responsibility for their part in the process of patient care very seriously. No paper patient can provoke comparable, powerful feelings” (p.638).

- “Students say that they remember more about a disease when they see a real patient than when they only read about it. Seeing real patients intensifies self study and efforts to link theory and patients. This promotes retention and facilitates retrieval of knowledge” (p.639).

- “Real patients stimulate not only acquisition of new knowledge but also activation of existing knowledge. Forging new links between new and prior knowledge strengthens students’ knowledge networks” (p.640).

- “Experiences with real patients improve students’ comprehension of subject matter,
because real patients are powerful illustrations of pathological mechanisms described in textbooks (p.641).

- “The results of our study indicate that in the students’ opinion their learning benefits from real patient contacts. The results furthermore demonstrate that, according to the students, different kinds of knowledge constructions are emerging and different ways of clinical reasoning, i.e., problem solving strategies, are developing.

**Learning Theories from the Article:**

This article makes no direct mention of learning theories, however many quotes imply the constructivist learning theory ideals such as scaffolding.

**Future Research Questions Based on Article:**

My question follow up questions would be:

1. In what ways could medical rounding influence practices in teacher professional development?
2. What are teacher’s perceptions of using instructional rounding as a form of professional development?

**Abstract:** An experiential approach to professional development (EPD) allowed Spanish teachers opportunities to improve their practice through demonstration, observation, collaboration, fieldwork, and reflection. As result of *experiential* professional development, Burke (2012) found that teachers’ knowledge about communicative language teaching developed, and teachers’ beliefs about language teaching changed. The Spanish teachers implemented communicative methods, which they had used rarely, if ever, prior to EPD. Through qualitative analysis of teacher questionnaires and written reflections, as well as the researcher’s observations and field notes, it was discovered that specific components of EPD made it successful. Teachers believed it promoted a collaborative community because it incorporated purposeful meetings, peer observations, and peer and student feedback. Teachers appreciated the on-site coaching and practical application that allowed them time to experiment with communicative methods. EPD provided an effective alternative to classroom-based university courses that allowed for viable change in classrooms. The results show that experiential educators should consider collaborating with professors, researchers, staff developers, school administrators, and teachers to create meaningful, transformative, EPD in which classroom teachers understand and apply theory and research into practice effectively.

**Relevant Quotations:**

- “Teachers learn by doing, reading, and reflecting (just as students do); by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (Darling-Hammond & McLaughlin, 2011, p. 83). Darling-Hammond and McLaughlin (2011) assert that professional development must encourage teachers to maintain the roles of both teacher and student and allow them struggle through the uncertainties of each role to deepen their understanding about pedagogy. They believe
that to instigate meaningful change, teachers must want to improve their practice, and they need to be involved in choosing what they will learn” (P.249).

• “Darling-Hammond and Richardson (2009) report that high-quality professional development must be centered on student learning, allow for collaboration among staff for an extended period of time, and promote active learning for teachers in their schools and classrooms” (p.250).

• “Change was achieved through this EPD (Experiential Professional Development) because teachers were offered the opportunity to take leadership in their own growth and learning and not leave their classrooms. The teachers were able to understand and apply theory and research into practice by engaging in practical learning experiences with support from a consultant. They were allowed the time and given the support to learn in their classrooms with their students.” (p.259)

• “By implementing professional development in schools that is experiential in nature, teachers can integrate innovative instruction such as differentiation, constructivist theory, discovery learning, inquiry-based learning, simulations, critical thinking, problem solving, technology-based learning, and performance-based assessment through demonstration, observation, collaboration, fieldwork, and reflection. With the help of experiential educators, perhaps professors, researchers, staff developers, school administrators, and teachers could create more opportunities for meaningful, transformative, experiential professional development in which classroom teachers understand and apply theory and research into practice effectively” (p.260).

Learning Theories from the Article:

This article makes no mention of theory until the conclusion:
“By implementing professional development in schools that is experiential in nature, teachers can integrate innovative instruction such as differentiation, constructivist theory, discovery learning, inquiry-based learning, simulations, critical thinking, problem solving, technology-based learning, and performance-based assessment through demonstration, observation, collaboration, fieldwork, and reflection”.

They mention constructivist theory but not in terms of teacher learning, in terms of the benefits of this type of TPD on student learning. They give no exact descriptions of what parts of this theory apply to TPD.

**Future Research Questions Based on Article:**

My question follow up questions would be:

1. In what ways does job embedded TPD impact instruction?
2. In what ways does job embedded TPS impact student achievement?


**Relevant Quotations:**

- “Real patient contacts early in medical education, i.e., in the preclinical phase, have been advocated for several reasons. They are assumed to ease the transition from preclinical to clinical training (Prince et al. 2000; Seabrook 2004), motivate students to learn (Prince et al. 2000), and help them forge their professional identity (O’Brien et al. 2001; Pitkala and Mantyranta 2003). Students have been reported to feel more comfortable performing physical examination (O’Brien et al. 2001) and be more aware of the impact of illness on patients (Cooper et al. 2001; Frank et al. 1996) as a result of seeing real patients” (p.634).
• “Reported positive effects also include improved acquisition and retention of knowledge (Prince et al. 2000; Seabrook 2004) and contextualisation of basic science knowledge (O’Brien et al. 2001; Mann 1994) by linking real patients with theory” (p.634).

• “Taking part in a real consultation with a real patient is a strong incentive for students to prepare for the contact. They are keen to avoid failure in front of a patient and take the responsibility for their part in the process of patient care very seriously. No paper patient can provoke comparable, powerful feelings” (p.638).

• “Students say that they remember more about a disease when they see a real patient than when they only read about it. Seeing real patients intensifies self study and efforts to link theory and patients. This promotes retention and facilitates retrieval of knowledge” (p.639).

• “Real patients stimulate not only acquisition of new knowledge but also activation of existing knowledge. Forging new links between new and prior knowledge strengthens students’ knowledge networks” (p.640).

• “Experiences with real patients improve students’ comprehension of subject matter, because real patients are powerful illustrations of pathological mechanisms described in textbooks (p.641).

• “The results of our study indicate that in the students’ opinion their learning benefits from real patient contacts. The results furthermore demonstrate that, according to the students, different kinds of knowledge constructions are emerging and different ways of clinical reasoning, i.e., problem solving strategies, are developing.

Learning Theories from the Article:
This article makes no direct mention of learning theories, however many quotes imply the constructivist learning theory ideals such as scaffolding.

Future Research Questions Based on Article:

My question follow up questions would be:

1. In what ways could medical rounding influence practices in teacher professional development?

2. What are teacher’s perceptions of using instructional rounding as a form of professional development?


Abstract: Valdosta State University iDoctors group was created to research technology tools and applications that promote engagement and interactivity in the classroom. One of our main goals since fall 2010 is to research iPad Apps, examine them and share personal learning experiences that we believe would improve teaching in the classroom with staff and faculty. During weekly meetings, members share information and best practices about the Apps they have used, tested and are confident would empower learning in the next generation classroom. In this round table interactive session, presenters will share some experiences on how these Apps are been used to
encourage a collaborative learning environment. Participants are encouraged to bring their iPads. Participants without the iPads are also welcome to attend.

This article focuses mainly on how to successfully integrate iPads into a learning organization. I think that this may be valuable in terms of the population that I hope to complete my dissertation in. It could be an avenue for participation in the professional development pieces as well as for participation in the group discussions. It did not directly apply to my research interests, however, I feel that it may give insights to design of the training and participation pieces that will be involved in the study.

**Key points from the article that were of interest:**

- “One important factor that may compromise the use of technology is to assume that instructors have the knowledge to properly utilize it in the classroom. Many schools acquire technologies without providing the appropriate training that will help instructors utilize the technology (Xiao & Carroll, 2007). Training is an important component in the process of transition to teaching with technology. Institutions that are not ready to provide training on how to use and integrate technology into existing curriculum may not see a significant difference in their curriculum and teaching outcomes. “

- “Not only do instructors need training, there should be forums where they can share ideas and best practices for technology use in teaching. Because full time faculties seldom have time to do much as they are already overwhelmed by their workload (Xiao & Carroll, 2007), working closely and sharing with peers may help. Instructors may also subscribe
to free online technology articles keep themselves informed about latest technological innovations “

- “The school IT (Information Technology) department must be equipped to service request for hardware and software help from instructors and other users. Professional development is critical for instructors to achieve success with technology use in the classroom. IT must also provide support for instructors and other users as technology change from time to time. This department must adopt technologies that are easy to upgrade, and one that integrates seamlessly with other technologies. “

- “Due to the dynamic nature of information technology, it is very important to continually develop training and professional development classes that users of technology can benefit from.”

Learning Theories from the Article:

“At these meetings, members demonstrate Dewey’s constructivist approach by sharing and practicing how to use different education apps. Apparently, anyone can download an app, but with the numbers of apps available today, it takes a collaborative approach to know which apps are actually useful and worthwhile”.

This article was based on constructivist learning theory as shown in the quotation above.

Future Research Questions Based on Article:

My question follow up questions would be:

1. In what ways does the use of iPads impact student achievement?

2. Do iPads have differing impact when considering subject area?

**Abstract:** This article reviews the multimedia instructional design literature based on cognitive load theory (CLT) in the context of foreign language learning. Multimedia are of particular importance in language learning materials because they incorporate text, image, and sound, thus offering an integrated learning experience of the four language skills (listening, speaking, reading, and writing). This use of multimedia, however, presents a challenge to instructional designers as to how the varied forms of media should be integrated to develop the best materials that facilitate learning without imposing a heavy cognitive load. This review provides a theoretical framework on CLT and examines the current research on the issue. Topics for further research are proposed for the benefit of foreign language learners.

**Summary of the article’s Interesting Info:**

This article was promising as far as the discussion of cognitive load theory in learning. They discuss how embedded information reduced cognitive load for novice learners but may have a reverse effect for expert learners due to the redundancy effect. This was slightly useful for my research, but did not have as much about my area of interest as I had hoped. As I am working with adult learners who are expert learners, it may be useful in terms of design. All in all, it was a good review of how the principles we have learned look in action in instructional design. I am
hoping that this article could at least inform the design of my trainings and virtual component of the dissertation study I am hoping to complete.

**Learning Theories from the Article:**

This article is vastly based on Cognitive learning theory, more specifically cognitive load theory.

**Future Research Questions Based on Article:**

My question follow up questions would be:

1. What impact does designing for a lesser cognitive load have on adult teacher professional development?
2. What impact does designing for cognitive load have on the user experience in TPD?


**Abstract:** Professional learning is a social enterprise where peers rely on the expertise and support of one another to adopt innovative practices. Reciprocal interactions in a community of practice, where teachers take responsibility for each other’s learning and development, may provide an effective means of supporting situated professional learning. We propose a collaborative apprenticeship model featuring reciprocal interactions as an approach to promote professional development, encouraging peer-teachers to serve as modelers and coaches of
strategies and ideas aimed at improving instruction. Collaborative apprenticeship is designed to help teachers learn and implement new teaching skills and strategies through four development phases, beginning with implementation of best practices from a mentor to the development of their own. Teachers, in turn, contribute new ideas to their teaching environment and become future mentors in order to sustain skills and strategies across a community of teachers. In addition to the model, we discuss various influences related to affect, beliefs, environment, culture, cognition, and personality that characterize the nature of reciprocal interactions in order to stimulate collaborative apprenticeship.

**Key points from the article that were of interest:**

- **Teacher Interaction:** “Professional learning is a social enterprise where peers rely on the expertise and support of one another to adopt innovative practices. Reciprocal interactions in a community of practice, where teachers take responsibility for each other’s learning and development, may provide an effective means of supporting situated professional learning” (Glazer & Hannafin, 2006 p.179).

- **Historically:** “In the United States, short workshops are commonly used outside of the school day to give teachers intensive and focused learning experiences. However, there is limited evidence that isolated professional learning experiences of this nature improve classroom practices (Fullan & Stiegelbauer, 1991; Loucks-Horsley, Hewson, Love, & Stiles, 1998). Workshops are discrete experiences that fail to provide ongoing support and continual feedback to attain long-term, systemic improvements (Mou-za, 2002)” (Glazer & Hannafin, 2006 p.179).

- **SBL Support:**“Skills and strategies simply do not transfer well when they are not learned

- **SBL Support:** “Teacher support is widely considered most effective when it is situated in everyday experiences, such as in classroom settings (Fullan & Stiegel-bauer, 1991)” (Glazer & Hannafin, p. 180).

- **Teacher Interaction:** “Research (cf., Lave & Wenger, 1990) has indicated that professional growth can be pervasive when learning is viewed as a collective enterprise, and stifled without continual interactions (Gallagher & Ford, 2002) where teachers share successful experiences and learn from each other’s mistakes (Boyd, 1992)” (Glazer & Hannafin, 2006 p.180).

- **Barriers:** “However, pragmatic constraints, such as limited resources and school budgets, affect the amount and quality of ongoing support provided by instructional and technical specialists” (Glazer & Hannafin, 2006 p.180).

- **SBL Support:** “Ideally, teachers become empowered by teaching, learning from, and supporting one another during their school day (Hall & Davis, 1995). Learning experiences are enhanced when they are situated in the context in which they will be needed (Brown et al., 1989)” (Glazer & Hannafin, 2006 p.180).

- **Teacher Interaction:** “Teachers can engage in these experiences through coaching and mentoring (Gottesman, 2000; Joyce & Weil, 1996; Kruse & Louis, 1993), where they model instructional strategies, obtain feedback, offer suggestions in an effort to improve instruction, and derive a shared understanding within the community (Browne & Ritchie, 1991). The mentoring process involves developing teaching expertise, fostering
relationships between colleagues, and responding to learning needs (Hertzog, 2002)” (Glazer & Hannafin, 2006 p.180).

- **Teacher Interaction:** “Support becomes a mutual responsibility, where individuals interact reciprocally with the intent to develop a common understanding that is distributed throughout the community” (Glazer & Hannafin, 2006 p.180).

- **Teacher Interaction:** “Thus, to progress in their implementation of new ideas and strategies, teachers need to employ methods that support reciprocity in their collegial environment—opportunities to interact with and learn from one another (Glazer & Hannafin, 2006 p.180).

- **Teacher Interaction:** “The interactions can be expressed through various forms of communication, such as in writing, verbal and non-verbal gestures, and physical movements. Reciprocal interactions can occur between individuals, such as colleagues troubleshooting an instructional problem, or among a community, such as a group of teachers collaboratively designing a curriculum” (Glazer & Hannafin, 2006 p.180).

- **Teacher Interaction:** “In a community of teachers, mutual engagement suggests teachers have opportunities to contribute and react to instructional, policy, curricular, and development decisions influencing their professional environment” (Glazer & Hannafin, 2006 p.181).

- **Teacher Interaction:** “In a community of practice, knowledge, skills, and strategies become socially negotiated among members in the community through legitimate peripheral participation (Lave & Wenger, 1990) and sharing stories (Orr, 1990)” (Glazer & Hannafin, 2006 p.181).
Learning Theories from the Article:

Learning theories are mentioned in the article in the concept of the value of interactions between educators. “In this process, learning can be stimulated through the interactions (Bandura, 1986) where individuals help one another maximize their learning potential, analogous to Vygotsky’s zone of proximal development (1978).” (p.180-181).

Future Research Questions Based on Article:

My question follow up questions would be:

1. How does reciprocal interaction impact professional learning?
2. How do teacher attributes influence collaborative apprenticeships?


Abstract: Administrators play a critical role in teachers’ professional development. An ambitious approach focuses on content, process, and context to ensure continuous improvement at the individual, collegial, and organizational level.

Citations from the article that may be useful:

- Job-Embedded:“Job-embedded professional development (JEPD) refers to teacher learning that is grounded in day-to-day teaching practice and is designed to enhance teachers’ content-specific instructional practices with the intent of improving student learning (Darling-Hammond & McLaughlin, 1995; Hirsh, 2009)” (in Ganser, 2010 p.2).
• **Job-Embedded:** “JEPD is a shared, ongoing process that is locally rooted and makes a direct connection between learning and application in daily practice, thereby requiring active teacher involvement in cooperative, inquiry-based work (Hawley & Valli, 1999)” in Ganser, 2010 p.2).

• **Collaboration/Job Embedded:** “If implemented and supported effectively, JEPD has the potential to contribute to the development of all teachers within a team or school by generating conversations among teachers about concrete acts of teaching and student learning (Wei, Darling Hammond, Andree, Richardson, & Orphanos, 2009)”( in Ganser, 2010p.5)

• **Peer/Coaching:** “EPD may consist of departmental, cross-departmental, grade-level, or “vertical” (i.e., across grade levels) teams of teachers engaging in “interactive, integrative, practical, and results-oriented” work (Fogarty & Pete, 2009, p. 32). Activities include designs such as mentoring; coaching; lesson study; action research; peer observation; examining student work; and virtual coaching, which consists of teachers using a “virtual bug-in-ear” technology to receive feedback from a coaching teacher during real-time instruction (Rock, Gregg, Gable, & Zigmond, 2009)” (in Ganser 2010, p.5).

• **PLCS:** “Professional learning communities (i.e., structured time for teachers to come together and discuss issues of teaching practice and student learning) can be forums for job-embedded professional development” (Ganser, 2010 p.5).

• **Barriers:** “District and school administration can provide this support by eliminating excessive paperwork and other non-instructional duties for teachers; coordinating teacher schedules; clarifying goals, outcomes, and priorities of the JEPD; and assisting in
collection of valid student and teacher performance measures (Hawley & Valli, 1999)” (Ganser, 2010 p.8).

• Support for Job Embedded: “Research-based knowledge about how adults learn also should inform the design of any effective professional development effort, particularly JEPD (National Staff Development Council, 2001). Adults learn best when they are self-directed, building new knowledge upon preexisting knowledge, and aware of the relevance and personal significance of what they are learning-grounding theoretical knowledge in actual events (Bransford, Brown, & Cocking, 2000; Knowles, Holton, & Swanson, 1998)” (Ganser, 2010 p.8).

• Support for Job Embedded: “These locally based plans show that JEPD is highly conducive to adult learning through its focus on concrete acts of teaching that are highly relevant to teachers while requiring their active participation and construction of professional knowledge” (Ganser, 2010 p.8).

• Support for Peer teaching/Modeling: “Create policies that allow teachers to advance as instructional leaders, master teachers, and JEPD facilitators while continuing to teach students for part of their workday or week” (Ganser, 2010 p.8).

**Journals to look for that may help based on this article:**


Learning Theories:

“Effective professional development takes into account the teacher as an adult learner and applies what is known about adult development (Sprinthall, Reiman, and Thies-Sprinthall 1996), learning styles, and ways of knowing to the teacher as learner. Because many forms of professional development require teachers and others to work together (e.g., participation in formal mentoring programs and networking with teachers in other schools), skill-building in collaboration is often the prescribed approach. Skills in working with others are especially important if the aim of professional development efforts is change (Guskey 1995). Effective professional development is also tailored to the various teacher career stages (Fessler and Christensen 1992)” (p.8).
It appears they reference adult learning theory, but no exact description of what parts of this theory apply to TPD. I may have to get the reference they have cited here in order to see if they are referring to andragogy.

My question follow up questions would be:

1. What impact does imbedding TPD into the school day have on teachers’ application of TPD practices in the classroom?
2. What types of experiential professional development impact TPD application in the classroom?


**Abstract:** Understanding the conditions through which teachers’ acquisition and use of new knowledge and skills are enhanced informs our understanding of effective models of professional development. In this article the authors examine some design principles to guide policy-makers and school reformers who seek to promote learner-centered professional development which involves teachers as active and reflective participants in the change process.

**Key points from the article that were of interest:**

- “Teachers learn by doing, reading, and reflecting (just as students do); by collaborating with other teachers; by looking closely at students and their work; and by sharing what they see” (Darling-Hammond & McLaughlin, 2011, p. 83).
- “Darling-Hammond and Richardson (2009) report that high-quality professional
development must be centered on student learning, allow for collaboration among staff for an extended period of time, and promote active learning for teachers in their schools and classrooms” (from Burke, 2013)

**Learning Theories from the Article:**

There was no mention of theory, however the practices that are promoted in the article are deeply socially constructivist. As described by Wikipedia ([http://en.wikipedia.org/wiki/Social_constructivism](http://en.wikipedia.org/wiki/Social_constructivism)), the concept uses Mead's Ideas of Socialization and Interaction and this way some aspects resemble ideas in Russian cultural psychology, wherein groups construct knowledge for one another, collaboratively creating a "small" culture of shared artifacts with shared meanings. When one is immersed within a culture of this sort, one is learning all the time about how to be a part of that culture on many levels. It is emphasized that culture plays a large role in the cognitive development of a person. Its origins are largely attributed to Lev Vygotsky.

**Future Research Questions Based on Article:**

My question follow up questions would be:

1. What does collaboration do to impact teacher acquisition of knowledge?
2. What impact does discussion of shared artifacts have on teacher acquisition of knowledge?

Abstract: This paper reports the outcomes of a ‘lesson study’ project conducted in a mathematics department with four serving teachers in a secondary school in England. Using Dudley’s lesson study framework and drawing on Hargreaves and Fullan’s notion of professional capital, the feasibility and value of collaborative lesson study as a vehicle for the development of teacher learning were explored. Planning and evaluation meetings as well as end-of-project interviews were analyzed to investigate how teachers planned research lessons together and how these were evaluated. Despite time constraints, teachers who engaged in lesson study reported that the process improved understanding of their students; that collaboration helped them to develop less-teacher-centered approaches and created a stronger sense of teacher community. The project demonstrated that lesson study has potential as an alternative or complementary model of teachers’ learning, but it also throws up substantive organizational challenges if its use is to expand.

Key points from the article that were of interest:

- “Lesson study is a classroom-based, collaborative mode of professional learning…” (Cajkler et al, 2014 p. 511).

- “…attempts to improve education have involved activities and changes to structures that do not focus specifically on teaching and learning…” (Cajkler et al, 2014 p.512).

- “…lesson study, the principal aim of which is to establish the learning, participation, and engagement of pupils as a central focus of teachers’ learning and practice development (Dudley, 2013)”(as cited in Cajkler, et al, 2014 p.512).

- The study concluded that teachers who used lesson study experienced an improved understanding of their students, worked collectively to create student centered approaches, and felt a stronger sense of community amongst peer teachers (Cajkler et al,
Learning Theories from the Article:

There was no mention of theory, however the practices that are promoted in the article are deeply socially constructivist. As described by Wikipedia (http://en.wikipedia.org/wiki/Social_constructivism), the concept uses Mead's Ideas of Socialization and Interaction and this way some aspects resemble ideas in Russian cultural psychology, wherein groups construct knowledge for one another, collaboratively creating a "small" culture of shared artifacts with shared meanings. When one is immersed within a culture of this sort, one is learning all the time about how to be a part of that culture on many levels. It is emphasized that culture plays a large role in the cognitive development of a person. Its origins are largely attributed to Lev Vygotsky.

Future Research Questions Based on Article:

My question follow up questions would be:

1. What does collaborative lesson study do to impact teacher acquisition of knowledge?
2. What impact does collaborative work that is student centered have on teachers’ classroom practice?

Abstract: In large numbers of elementary and secondary schools across the United States teachers are being called upon to provide support to colleagues through a process called “instructional coaching.” Despite widespread implementation of this role, resulting in part from federal initiatives, there is little consensus regarding its operational definition and little empirical research related to it. Following a brief description of the evolution of coaching along with a descriptive discussion of its implementation in schools, the authors describe various implementations of coaching, concluding that there is a need for fully-articulated theoretical and operational models of instructional coaching. The authors compare various coaching approaches to instructional and collaborative consultation and suggest that there is good reason for active communication and collaboration between consultants and coaches operating within the same schools. Finally, they describe current trends and needs related to professional development of instructional coaches and articulate a research agenda related to the field.

Key points from the article that were of interest:

- “It was during the 1980s, according to Showers et al., that enough research on the topic of teacher professional development had been conducted to permit the formation of a theoretical hypothesis about how teachers learn new skills and strategies. They concluded that when teachers learn about new practices through presentations of new knowledge and skills, along with (a) presentation of the theory underlying these practices, (b) opportunities for practice and feedback, and (c) observation of demonstrations of the new practices, they develop a level of cognitive understanding that enables them to integrate new teaching behaviors into their practice and the ability to apply these new behaviors thoughtfully and purposefully during instruction (Showers et al., 1987) (p.152)
• “The idea of providing sustained, job-embedded professional development and support to teachers has a strong intuitive appeal, and there has been a ‘‘headlong rush’’ into putting coaching into practice, due, in large part, to the initiatives described above” (p.154)

• “Based on a publication by Bean (2004, as cited in IRA, 2004), the IRA statement described three levels of intensity of activities in which coaches may potentially engage. Level 1 in this model is described as informal and focused on relationship-building, and includes activities such as leading teacher study groups; meeting with teachers to discuss issues or needs, set goals, or solve problems; and assisting with student assessment. Level 2 is characterized as more formal and intense, and includes activities such as co-planning lessons, helping teachers interpret student assessment data to plan effective instruction, and presenting professional development sessions. Level 3, the most formal and intense, includes activities that may be stressful for both the coach and teacher, such as modeling instruction, co-teaching, and observing teachers and providing feedback about their instruction” (p.156).

Learning Theories from the Article:

There was a brief mention of cognition. There was no mention of social constructivism, however if I were looking at the practice of coaching as a form of teacher professional development, this would be a logical theoretical area to explore.

Future Research Questions Based on Article:

My question follow up questions would be:
1. What impact does coaching have on teachers’ self-reported use of new instructional approaches?

2. What impact does coaching have on student reading achievement?


**Abstract:** Collaborative inquiry groups, such as professional learning communities and lesson study groups, are proliferating in schools across the United States. In whatever form, the potential for impacting student learning through this collaborative work is expanded or limited by the nature of teachers’ conversations. Polite, congenial conversations remain superficially focused on sharing stories of practice, whereas collegial dialogue probes more deeply into teaching and learning. Examples of talk taken from collaborative teacher inquiry groups are used to illustrate these important differences. Specific recommendations are provided, including the role that teacher leaders can play in adopting and modeling specific strategies that support the use of more substantive professional conversation.

**Summary and Key points from the article that were of interest:**
Because I am trying to be a bit critical of the PLC, I cited areas that were more of the concerns in terms of what PLCs lack in the area of teacher professional development (TPD). There are some concerns and challenges in terms of the state of PLCs and their effectiveness as form of TPD and changes in practice. Nelson, Deuel, Slavit, and Kennedy (2010)(1) describe the way in which teachers are hesitant to engage in critiques by saying, “Polite, congenial conversations remain superficially focused on sharing stories of practice, whereas collegial dialogue probes more deeply into teaching and learning” (p.175). They go on to state that two factors contribute to this fruitless dialogue, which are school culture and a lack of experience with evidence-based conversations (p.176). In an update to the article, the authors further explain that congeniality in a culture creates little change and is often the result of long standing norms, such as privacy for teachers, and avoids deep and probing conversations about instructional practices (Nelson et al 2010(2), p.3). With out these more meaningful interactions, PLCs may have little value in terms of changes in practice.

Learning Theories from the Article:

The ideas of using a PLC for teacher professional learning is a constructivist based notion. The idea of learning from peers and scaffolding each other to higher learning is a significant theory that drives the use of PLCs.

Future Research Questions Based on Article:

My question follow up questions would be:

1. What impact does adding a component of classroom imbedded TPD have on self reported change in teacher practice?
2. What impact does using classroom observation as the basis for PLC conversations have on the type of interactions that occur in a PLC?


Abstract: Realizing the potential of online or virtual communities to facilitate teacher professional development requires educators to change their current perceptions of professional development. This calls for educators to develop new images of ongoing opportunities for professional development, based on their needs within an online community of learners and their recognition that communities may include individuals from local regions and from around the world who share mutual interests and goals. The realization of online learning communities to facilitate teacher professional development is a matter of carefully and deliberatively designing dynamic learning environments that foster a learning culture. This requires a pedagogical framework that nurtures the establishment of relationships, intimacy, and trust, where people engage in shared learning experiences mediated through technology. Designing an online learning environment that fosters the development of a learning community is not about adding technology on to current professional development practices. Rather, it is about designing, building, and supporting a structure and a process that are purposeful and fluid in nature and in meeting the personal ongoing professional development needs of teachers.

Quotations from the article that were of interest:

Smith, 1999). The following issues have influenced the level of impact PD has had on teachers’ changing and improving their practice: (a) one-shot and one-size-fits all workshops; (b) use of the transmission model from experts to teachers; (c) failure to address school-specific differences; (d) just-in-case training; and (e) system-wide presentations that do not provide sufficient time to plan or to learn new strategies to meet the reality of their own classrooms. Professional development has been organized in terms of events or periodic activities, with a focus on training that tends not be context specific

(p.665)
In contrast, a second view of practice, according to Lester (1995) is that of postindustrial practice. This “creative-interpretive model of professional work” is based on an understanding of the complexity of interconnectedness of values, perspectives, and logic needed in identifying and exploring problems. Within this approach, teachers’ learning can be entrenched in their own work that includes “processes of inquiry, discussion, evaluation, consultation, collaboration, and problem solving” (Reitzug, 2002, p. 237). Darling-Hammond (2005) believed what is needed are “infinitely skilled” teachers: teachers who understand learning as well as teaching, who can address students’ needs as well as the demands of their disciplines, and who can create bridges between students’ experiences and curriculum goals” (p. 5).

(p.666)

other to accomplish certain ends.” A learning community is unified by a “common cause of mutual support and learning, and by shared values and experiences...Learning communities provide a means for learning within an atmosphere of trust, support, common goals, and respect for diversity” (Jonassen, Peck & Wilson, 1998). There must be a commitment to the learning process by the community members (Garber, 2004).

(p.667)

1998, p. 60). According to Preece (2000), an online community consists of: (a) people who interact socially as they try to satisfy their own needs or perform special roles; (b) a shared purpose that provides the motive for the community; (c) policies to guide the people’s interactions; and (d) computer systems to support and mediate the interactions and facilitate the sense of togetherness.

(p.667)

It is the partnerships and interactions among people who gather together that define community, and not the digital media, that are used (Riel, 1996). The computer systems provide the online gathering space for connections and interactions that foster the “process of building and rebuilding interpersonal relationships” (Di Petta, 1998, p. 62). Groups of people not only interact within these structures but also with local and

(p.667)

Why use a community approach with the new professional development paradigm? Cross (1998) believed there are three main reasons for using learning communities: “philosophical (because learning communities fit into a changing philosophy of knowledge), research based (because learning communities fit with what research tells us about learning), and pragmatic (because learning communities work)” (p. 4). From their research of teacher communities, Grossman, Wineburg, and Woolworth (2001) argued community is good for intellectual renewal, a venue for new learning, and a venue for cultivating leadership. This rationale for using community provides a foundation for envisioning how online learning communities can be used in support of teacher professional development.

(p.668)
This article has some valuable information if you are interested in creating an online PLC. It may not be as useful for me in terms of my future research, unless I use an Asynchronous format. It does a good job of reviewing what an online PLC is and the benefits.
and drawbacks to this form of TPD. It also gives suggestions for a successful implementation of an online PLC.

**Learning Theories from the Article:**

There was a major theory presented in the article. They discuss constructivism, specifically social constructivist theory. It applies this theory to the online learning community as they theoretical foundations for successful learning in a community. The idea that learning is socially constructed through interaction is critical to the success of this type of professional learning community.

**Future Research Questions Based on Article:**

My question follow up questions would be:

1. What are teacher’s perceptions of online PLCs?
2. What impacts do PLCs have on teacher classroom practice?


**Abstract:** This article introduces the main outcomes of discussions at EDUsummIT 2011 by the specific Technical Working Group on Teacher Professional Development (TWG3). The focus was to explore how professional development of teachers may ensure that teachers are better prepared to use information and communication technology (ICT) to promote 21st century learning.
The article is organized into three main sections: a review of key literature on professional development of teachers (TPD), in general and with specific reference to ICT; a summary of the key points emerging from TWG3’s discussions; and recommendations for action.

On the basis of discussions held within the TWG3, the authors concluded that effective TPD requires changes at several levels of educational systems (political, institutional and individual), and that ICTs should be seen as an opportunity for introducing new goals, structures and roles that support these changes. It is significant that while many of the issues highlighted by the group are well established, addressing them continues to be problematic globally.

**Quotations from the article that were of interest:**

- “In fact, recent research (e.g., Walsh, Bradshaw, & Twining, 2011) points towards the importance of informal elements, such as collegiality, for encouraging reciprocal learning between beginning and experienced teachers (Patrick, Elliot, Hulme, & McPhee, 2010) and to the value of informal practice-based learning networks for sustained professional development of teachers (Bradshaw, Twining, & Walsh, 2011; Hanraets, Hulsebosch, & de Laat, 2011). Other research has confirmed the value of teacher cooperation for professional development while highlighting the importance of support at all levels within a school (Schulz-Zander & Eickelmann, 2010)” (p.427).
- “A systematic review of research on professional development found that there are some key features of professional development which are linked to better achievement by children:
  - Observation of teaching;
  - Feedback to teachers
• The use of external expertise linked to school-based activities
• Scope for teachers to identify their own CPD focus;
• An emphasis on peer support;
• Processes to encourage, extend and structure professional dialogue; and
• Processes for sustaining CPD over time to enable teachers to embed practice in their classrooms. “(P.427)

• “This analysis resonates with the need for TPD to be collaborative, experimental and reflective (Baumfield, Hall, & Wall, 2008; Coolahan, 2002; Fraser, Kennedy, Reid, & Mckinney, 2007; Hall, 2009; Murchan, Loxley, & Johnston, 2009; Williamson & Morgan, 2009). Consistent with that, in the broader context of both UNESCO (Villegas-Reimers, 2003), and the European Union, the school is seen as a learning organization where TPD has a place in the sense of an active and constructive process that is problem oriented, grounded in social settings and circumstances, and (. . .) throughout teachers’ lives (Scheerens, 2010, p. 32)” (P.427).

• “Problematically, the conventional structure of schools results in teachers mostly working in isolation from each other in their classrooms (Dodor, Sira, & Hausafus, 2010; Heider, 2005; Lortie, 1975).” (p.274)

• “If teachers are to engage in pedagogical innovation then they need to be prepared with knowledge beyond what is essential for operating in classrooms, as they are currently constituted (Law, 2008). However, research continues to find that, even in teacher preparation programmes that promote use of ICT for active student learning, ICT is used mostly for productivity and information presentation (Graham, Tripp, & Wentworth, 2009)” (P.428).

• “More recently, Belland (2009) used the sociological concept of habitus as an alternative basis for explaining teachers’ apparent reluctance to adopt ICT. In that view, 12 years of primary and secondary schooling, in which ICT was either not present or not integral,
leaves prospective teachers with understandings of how education is practised that are difficult to change in the short period of an initial teacher preparation programme, especially if that programme also fails to make ICT integral” (p.428).

• “Lastly, research targeted on TPD and ICT integration highlights the importance of institutional and group professional learning environments as models to overcome the problem of teaching as an isolated profession (Hargreaves, 2010; Lortie, 1975). CoPs and PLCs have been proposed as approaches to reducing isolation and encouraging professional growth” (p.428).

• “Hur and Brush (2009) investigated self-generated online communities of teachers and reported that reasons for participation were most often related to experience of personal support. In a more structured approach with a focus on technology integration, teachers progressed through mentoring to a teacher-led CoP that supported more student-centred use of technology (Kopcha, 2010)” (P.429).

• “Starting at the bottom of Figure 1, a general underpinning principle is that effective practice (using IT to enhance learning and teaching) requires an integration of discipline expertise, pedagogical expertise and IT competence, which includes technical skills (TPACK). One of the challenges teachers face in achieving this blend is to know what good performance looks like and that challenge is compounded when other stakeholders, such as parents and policymakers hold different views of what constitutes good performance. Hence, it is critically important to engage all stakeholders in developing a shared vision for education and the role of IT” (p.433).

• “Accordingly, TPD must be seen as forming a career-long continuum (pre-service, in-service and lifelong) and policy should provide for minimum entitlements and
requirements for professional development. So important is the continuing development of teachers for the success of new educational initiatives that policy should ensure that dedicated funding is set aside for related TPD” (p.433).

• “Developing teacher educators so that they can model effective integration of IT will assist teachers at all stages to appreciate the vision for effective integration and build their own performance accordingly” (p.433)

• “The apparent disconnect between educational research and the practice of teachers in classrooms has been noted previously. There is a need for educational research that is more closely connected to, and informs, the practice of teachers and vice versa” (p.433).

• “However, one of the most significant ‘findings’ from the TWG3 discussions was that while many of the issues relating to effective TPD are not new, much TPD across the world continues to ignore them, resulting in the overall pattern of TPD being a not very effective activity (e.g., Opfer, Pedder, & Lavicza, 2008). Thus, the gauntlet that EDUsummIT 2011 has thrown down, to move education into the digital age, is a challenging one, which will require significant political will. However, any countries that fail to rise to this challenge are likely to limit the possibilities of their people for access to knowledge as well as full participation and expression in a global society” (p. 434).

This article could be very helpful in terms of framing my future research as my hope is to do some form of TPD study with possible use of IT as one of the delivery modes. I am not sure exactly what this looks like yet, but leaning towards a study that involves medical rounding as a basis for TPD. The groups could or may include a group that rounds in the classroom and one who rounds virtually. The ideas presented in this paper about ICT and PD hit around the topic I
may work on. I am hoping to read more on the topics of adult learning theory as my theoretical basis for the study, so I hope on article I find may lead me to more information in that area. So far, this article explores TPACK, which is an important model in our field, but is not exactly what I am seeking in the world of TPD.

**Learning Theories from the Article:**

There was not a huge theoretical basis in this article, as it covered a lot of ground in TPD and IT. There were definite nods to the TPACK framework as being of importance in IT TPD. This is not exactly a theory, but an important framework in our field. They make a blanket statement about theory in saying, “here was general agreement that TPD aimed to develop teachers’ capability to use IT in ways that *transform* practice while preparing them to work effectively within the current system (e.g., using IT to *support* and *extend* practice) needs to include a focus on underpinning principles and theories of education relating to the philosophy of education, learning theory and change management” (p.432). They do no specifically discuss what educational theories are best utilized when planning IT TPD or TPD that uses IT as a delivery method. This is information of great interest to me in my future research. They do discuss on theory from sociology as a basis for IT resistance by saying, “More recently, Belland (2009) used the sociological concept of *habitus* as an alternative basis for explaining teachers’ apparent reluctance to adopt ICT. In that view, 12 years of primary and secondary schooling, in which ICT was either not present or not integral, leaves prospective teachers with understandings of how education is practised that are difficult to change in the short period of an initial teacher preparation programme, especially if that programme also fails to make ICT integral” (P.428). Ultimately, no strong theory supports the entire discussion in the article.
**Future Research Questions Based on Article:**

My question follow up questions would be:

1. What impacts do different forms of TPD have on future practice?
2. What types of impact does the delivery method of TPD have on teacher’s future classroom applications of learning?


**Abstract:** Research suggests that professional development that engages teachers in instructional inquiry over an extended time through collaborative professional learning communities (PLCs) is effective in improving instruction and student achievement. Still, most professional development is offered as short-duration workshops that are not effective in changing practice. Barriers to the implementation of PLCs include lack of shared meeting time and a shortage of teachers who share the same subject areas or common goals and interests. Convening teachers from multiple districts can alleviate this problem, but teachers are reluctant to travel for meetings due to time and cost restraints. Video-conferencing software offers a solution to these barriers while serving to foster the sense of community needed for PLCs to be effective. The researchers describe the use of Virtual PLCs in which two groups of teachers met monthly for one school year to collaboratively analyze evidence collected as part of their teacher inquiry plans. With help from
a facilitator, these groups developed a relationship similar to other groups meeting face-to-face as part of the same professional development program. Analysis of the reflections of teacher-participants and facilitators revealed that teachers prefer face-to-face meetings, but that the virtual and face-to-face meetings provided teachers with similar social interactions in the PLC experience. The findings suggest that teachers perceive videoconferencing as an effective tool for facilitating PLCs when distance and time are practical barriers to face-to-face meetings. Practical considerations for developing and facilitating virtual PLCs are also discussed.

**Quotations from the article that were of interest:**

- Researchers in the Problem-Based Learning (PBL) Project for Teachers explored the use of videoconferencing to support and facilitate professional learning communities. Two-way video technology has been used to support classroom observations (Bell and Garofalo 2006; Dyke et al. 2008), distance learning (Kincade 2004; Salinas 2005), and virtual town hall meetings (Crane and Raucci 2003; Elliott 2009), but literature on how videoconferencing can be used to support learning communities for professional development is less common (Kincade 2004; Ullman 2010). (p.267)

- Barriers to the implementation of PLCs include lack of shared meeting time and a shortage of teachers who share the same subject areas or common goals and interests. (p.267)

  - While several models of professional learning communities have been presented, several key components must be included in the design of a PLC. (p.269)
    - Supportive and shared leadership
    - Shared values and vision
Collective learning and application of learning
Supportive conditions (physical, human capacities)
Shared practice (Hord 1998)

“Teachers often resist attempts to enlist participants in long-term intensive PD programs (Zhang et al. 2008), especially when the commitment includes travel from school to some other site. “ (p.269)

“A promising strategy for facilitating these collaborative efforts is the use of Internet resources. Ford et al. (2008) use the term virtual professional learning community (VPLC) to describe various media and software environments. These VPLCs have been implemented in many different forms, including bulletin board discussion groups, course management software, asynchronous text-based collaborations like wikis and blogs, video conferencing software such as Skype (Carle`n and Job ring 2005; Charalambos and Michalinos 2004; Dede 2004a; Duncan-Howell 2010; Howard et al. 2004; Orill 2002; Sorensen and Murchu 2004), and even Twitter (Trinkle 2009). All of these examples have a similar goal: using technology to support collaborative learning among participants separated by geographic or temporal barriers. Of these tools, the most relevant to this paper is the use of videoconferencing. (p.269)

“During the 4th cohort of participants, the PBL Project elected to utilize MarratechTM (2007), an application that permits multiple users to log into a “room” that supports video and audio conferencing with access to a “whiteboard” for recording typed or handwritten notes and diagrams. Users can also share files to allow collaboration on written artifacts. The software includes an archiving feature to save the information
generated on the whiteboard. The meetings of two “Focus on Practice” groups during this cohort illustrate Virtual Professional Learning Communities (VPCLs)”

- “Assertion #1: Teachers in Virtual PLCs Using Videoconferencing Software Experience the Same Benefits as Members of Face-to-Face PLCs” (p.272).
- “Assertion #2: Virtual PLCs are an Effective Alternative When Face-to-Face Meetings are Not Practical” (p.273).
- “The preliminary findings of this study clearly support the continued use of videoconferencing as a medium in which to facilitate professional learning conferences can be facilitated. The sample size for this study was small, but the ease with which these teachers adapted to a new learning environment suggests that a more diverse group of teachers might have similar success in a VPLC environment. A next step in the analysis will include examining the changes in teacher knowledge and practice resulting from the PD program, including the VPLC groups” (p.275).

This article will be important in terms of my future research. I am planning to do online PD for my study and all articles that talk on this topic are useful in framing my study design and questions going forward. This one is exceptionally helpful in guiding my research not only due to its findings, but also to its suggestions for future research topics. I felt the above quotes would be most useful in a future literature review and I chose examples that would be relevant to studying online teacher PD. I especially connected with e the finding that videoconferencing tools could be effective in the arena of teacher PD and was found to be as effective as face-to-face meetings. One of the concerns I would have in this study is the small sample size. I would want to be sure that a sample size would be large enough to truly
make this generalization. If I were to use the author’s suggested future research, the questions would be as written below. The author suggests some ideas for future research in this topic area. I have listed this in the next section.

**Future Research Questions Based on Article:**

“A next step in the analysis will include examining the changes in teacher knowledge and practice resulting from the PD program, including the VPLC groups” (p.275).

**My question follow up question would be:**

1. Do virtual PLCs result in a significant increase in teacher knowledge?
2. Do virtual PLCs result in a significant amount of change to classroom practice?


**Abstract:** With the adoption of Common Core State Standards (CCSS) in English Language Arts (ELA) and math and the release and beginning adoptions of the Next Generation Science Standards (NGSS), teachers, schools, and districts are clamoring for professional learning opportunities to refine and re-tool teaching to bring it in line with the reform visions in these documents. This increased need for professional development (PD) raises the question of the capacity of current systems of PD as well as the effectiveness of the most commonly used approaches. The nature of the new demands of these reforms and the scale of the need means that PD will have to use innovative approaches to handle the type of complex learning called for in
these reforms, and will have to do so at scale (Wilson, 2013). Many may see online learning environments as part of a solution to address the scale issues, because of the ability to use this technology to reach broad audiences across a wide range of timeframes. There is interest in online or technology-mediated environments that promise certain kinds of functionality to support teachers in the complex work they are being asked to do (U.S. Department of Education, 2010). Wilson (2013) identifies the need to “harness new technologies and social media to make high-quality science PD available to all teachers” as one of the grand challenges in science education. We argue as part of our response to Fishman et al. that a corollary to the challenge of access is the challenge of developing research-based design principles to guide the ongoing development, implementation, and evaluation efforts in online PD to meet these new, complex demands in teacher learning. Others share this concern. Dede, Ketelhut, Whitehouse, Breit, and McCloskey (2009) lay out the case for the growing importance of online delivery of PD. At the same time, they convey unease about the scarcity of nuanced empirical work to guide the design and implementation of online PD models. Dede et al. make a twofold clarion call to funders and the field to (a) conduct empirical research to tease apart not only what works but why and (b) focus on theory building that articulates design principles that can guide effective PD, disseminated in ways helpful to practitioners and researchers alike.

Quotations from the article that were of interest:

- “Thus, Fishman et al. have taken the first step in documenting that online PD, matched in approach, can equal the outcomes of face-to-face PD. The field can now proceed with more nuanced design questions to examine the trade-offs involved in technology support and face-to-face interaction with the elements of a PD system crafted to support learning”
• “We argue the field needs to go beyond treating modality as a main effect that considers online and face-to-face as two discrete forms of PD, and needs to investigate how these conditions interact with design features of the PD” (p.2).

• “There are affordances of online systems that simply can not be matched in a traditional setting. However, as a field, we know little about how these web-enabled and social media capacities interact with teacher learning and whether or how they are in line with established ideas about professional learning in general. By connecting particular design elements to the theoretical basis for the design and to a set of research questions about that design, the important work of theory building for online PD, indeed PD more generally, can proceed” (p.5).

• “We explore questions not centered on whether technology is used, but rather on how it is used to help structure and support the learning interactions. For example, simple web technology makes it possible for teachers to seamlessly move between sketching out ideas on a whiteboard and capturing them for later use by their own group, as well as communication with other groups (via uploading images from a cell phone to the online environment). How then do teachers use these records of their earlier thinking in various learning tasks, such as later discussions or individual writing assignments, or in trying out ideas in their own classrooms that have clear linkages to a particular genre of learning tasks?” (p.5).

This article could be very helpful in terms of framing my future research. I think the most valid point they make is about not knowing how these new technologies provide PD and
what the results of that PD looks like in a real classroom. I am hoping to do online PD for my study and all articles that talk on this topic are useful in framing my study design and questions going forward. I felt the above quotes would be most useful in a future literature review and I chose examples that would be relevant to studying online teacher PD. Based on the article, the questions that I would think that need further exploration are below.

**Future Research Questions Based on Article:**

**My question follow up questions would be:**

1. In what ways do teachers apply online professional development artifacts in their classroom teaching?

2. Does delivery mode of PD have a significant impact on classroom application?