

Incorporating Modern Professional Development to Enhance Pre-Service Teachers' Knowledge

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The United States federal government spends \$2.5 billion on professional development (PD) each year. Once the individual states contribute, the number increases to \$5 or \$6 billion. Arne Duncan, the US Secretary of Education, argues they are misspent funds (Flannery, 2012). Teachers are being bombarded with a tremendously mixed signal to make their classrooms more engaging and include 21st century skills, yet the learning provided to them is nothing short of archaic at best. Teachers are provided PD opportunities a few times of year and typically sit in large rooms and listen to a speaker who is considered an expert. Another stumbling block to this current model is money. School districts do not have the resources to continually train large numbers of teachers and keep them current on educational technology trends. As a result, many teachers have resorted to spending their own money for training.

One change taking place in some areas of education with creating professional development opportunities that meet the needs of teachers as well as work within the constraints of school schedules and local funding, and online environments have these benefits (Tinker, 2003). This evolving new format for PD is based in allowing teachers the ability to customize to their own learning needs, fit learning into their busy day, and afford the costs. Historically, teaching has consisted of transmitting information from the main source to the recipients (Dawley, 2009), but social media has allowed for connec-

tions to occur that transform that older model. As technologies change, the ability to and ways of connecting transform as well. Engagement and usefulness have been shown to be key for greater teacher participation (Kwakman, 2003), and online environments could tap into such vital aspects of quality PD.

Literature

The literature does not contain extensive research about the effectiveness of online PD or the experience teachers have when learning online, but one recent study provides interesting results on the topic. One recent study on the effectiveness of online learning compared the two modalities of face-to-face and online PD with a group of teachers learning about and implementing a new science curriculum. Teachers in both groups had the same access to computer-based simulations and print support materials. No significant differences were found between the two modes. Researchers used video of classroom teaching to assess strategies being implemented as well as testing teachers' knowledge in the content area and evaluating student assessment scores (Fishman, Kostantopoulous, Kubitskey, Vath, Park, Johnson, & Edelson, 2013). The perspective of preservice teachers when evaluating online PD is absent from the literature. Additionally, the literature does not fully explore online PD benefits in relation to connected learning theory. The anticipated benefit from this study is to add research about preservice and inservice teachers' PD experience in an

online format to the literature about online PD and connected learning theory. This study's findings do not suggest that traditional PD is outdated and should be abandoned, but the results do open the door for educators to explore that options are available for quality PD and learning.

As teachers work with new options for PD, preservice teachers can also work with these new avenues and begin to understand how to shape their own learning as a future educator. Preservice teachers should be able to have knowledge about, be able to evaluate, and implement new and emerging technology. To effectively meet these standards, educational technology courses can include an additional component of helping preservice teachers understand how to constantly expand their professional learning networks (PLNs) to access on-going professional development. Technology is rapidly changing, so to simply teach current technological applications used in education does not truly meet the depth of the standards assigned to educational technology courses nor does it prepare preservice teachers for their future classroom environments. Learning about current technology is helpful, but transforming courses to help preservice teachers learn how to create their *own* network of connections and training about technology is crucial to their success as a teacher in a modern classroom.

The conference, Connect 2 Learn (C2L), was created in response to these concerns related to technology PD for educators. The conference has online sessions showcasing the knowledge of K-12 teachers, preservice teachers, and higher education faculty. The sessions focus entirely on how technology is enhancing instruction in the K-12 classroom. Sessions are orga-

nized by topic and published online on the C2L website. Educators can access these sessions at any time after the conference sessions are available. The creators of the conference are preservice teachers enrolled in an educational technology course and include both elementary and secondary majors. The course was transformed from students simply learning about current technology available to teachers to a course where students partner with area teachers to create a free online educational technology conference.

Theoretical Framework

Connected learning theory is one lens to view research related to the C2L conference; this theory encourages open access to learning that is interest-driven and socially connected. An important aspect of connected learning theory is the ability for the learner to gain knowledge as well as establish a network of support in the learning process (Ito, Gutierrez, Livingstone, Penuel, Rhodes, Salen, Schor, Sefton-Green, Watkins, 2013). Learning in a connected environment has the potential of creating an educated and learning society (Sims, 2008). Since there can often be a gap between traditional and non-traditional learning opportunities, digital media plays a vital role in connected learning theory by providing an easy link to a network of those with shared interests as well as valuable information. From those connections, new concepts and knowledge can emerge that might not be discovered in traditional formats (Kays & Francis, 2004). Even though the use of media may vary, learners are using these modes to support a connected learning experience (Andrews, Tynan, & James, 2011). Digital media is used in connected learning to offer engaging formats, increase access to knowledge and information, and provide support

through social media, and provide a diverse range of expertise. The theory is a link to understanding learning that is growing out of technological, social, and cultural changes (Ito, et al, 2013).

The framework for connected learning has a particular context that is needed for learning to happen. That context should include peer support, interest, and be academically oriented. Learners are able to grow within the knowledge they are gaining when they can have quality exchanges in a social setting about topics that are interest-motivated. Once those two aspects are brought together in an academic setting, the connected learning can flourish (Ito, et al, 2013). The process of connecting learners is also starting to evolve. Social media allows teachers to construct a PLN that reaches far beyond their own campus or those few PD presenters that their school district provides each year. The 21st century requires educators to collaborate and use a collective intelligence along with smart tools, yet to do this effectively, we must employ what Gee (2013) calls synchronized intelligence, which is a way of organizing people and tools to effectively contribute and solve problems. Online PD can be organized in such a way that contributors can be connected to one other through social media after making initial contact in an online environment. These connections can last and provide teachers with the ability to access more knowledge and clarifications. Online communities can help teachers interact and support each other as they implement new strategies or use new tools allowing teachers reflective interactions they cannot find in the course of a normal school day (Schlager & Fusco, 2004).

Methodology

This qualitative study examined

how participants view the online professional development experience opposed to a more traditional face-to-face learning environment. Connected learning theory guides this part of the study as themes emerge from questionnaire responses. Data were collected using a questionnaire available on the C2L website to those attending the online conference. Participation was strictly voluntary and not required to attend the C2L conference. This study is most closely related methodologically to Merriam's (1988) definition of a qualitative study in that assessing the professional development experience cannot be measured fully in the format of the positivist quantitative inquiry.

Participants included preservice teachers enrolled in the educational technology course that was organizing the C2L conference. Additionally, teachers currently teaching in K-12 schools were invited to participate in the conference and given the opportunity to complete the questionnaire for the study. Over the span of two years (and two conference cycles), data were collected from an online questionnaire with a total of 85 participants completing it. The 85 participants included: 62 preservice teachers and 23 teachers currently teaching in the K-12 classroom. None of the participants had previously participated in online PD, so they could only compare their experience with the C2L Conference to traditional PD.

Research questions for this study about preservice preparation and implementation of online professional development:

RQ1: How does the online PD conference experience meet the four ways connected learning theory uses digital media for learning? (Ito, et al, 2013)

RQ1a: Engaging Formats: How do participants view the online PD experience in comparison to traditional PD?

RQ1b: Increase Access to Knowledge and Information: How does participation in planning PD affect preservice teacher participants' view of PD?

RQ1c: Support Through Social Media: How do participants view the growth of their PLN related to participation in PD and related social media?

RQ1d: Provide Diverse Range of Expertise: What diversity in experience is provided by the presenters?

Results

The questionnaire from the participants was the primary data source (n=85). Using the descriptive coding method (Miles & Huberman, 1994; Wolcott, 1994), each answer to the open-ended questions on the questionnaires were given descriptive codes summarizing the responses. Descriptive coding "summarizes in a word or short phrases – most often as a noun – the basic topic of a passage of qualitative data" (Saldana, 1994, p. 70). All of the participants an-

swered the same questions, so themes found in the results were grouped according to the connected learning theory tenets after the descriptive coding was complete. Then the 6 main principles of connected learning theory (interest-driven, peer-supported, academically-orientated, production-centered, openly networked, shared purpose) were coded within themes. See Table 1 for the themes related to the participants' questionnaires as it relates to the connected learning theory.

As table 1 illustrates, the key tenets of connected learning theory were derived from the principles of the theory. The responses on the questionnaires were coded according to these key tenets in order to find the themes. Those specific themes were evident in the majority of responses from participants.

Engaging Formats

When comparing the online PD experience to traditional face-to-face PD, the participants had similar outlooks. Choice and convenience were discussed in the majority of responses. Participants discussed how they might have numerous options for sessions at a traditional conference, but typically, PD held on a campus or within

a school district is quite limited. One participant explained, "With traditional PD, you spend so much time learning about things that you may not have an interest in or you may already know a lot about. With online PD, you have the option to choose what to learn more about." Alongside choice, most participants discussed convenience as a positive with their online PD learning. Participants talked about how when they think of attending a conference, the first thing that comes to mind is lectures or presentations in a cold ballroom. They further explained that being able to sit at their own computer in the comfort of their own home made a difference in their motivation to want to attend the conference. The time factor of attending the online PD and pausing to come back later was important, as one participant explained, "I didn't have to drive somewhere and be at a certain place at a certain time. I could see it whenever I was ready." They could take a break and come back to the conference to finish watching videos. While the participants did not want to classify traditional face-to-face conferences as negative or unnecessary, the C2L conference gave them a new way to learn in professional development: "I never thought that

Table 1. Connected Learning Themes Related to Participants' Questionnaires

Themes Found in Data	Connected Learning Theory Key Tenets	Principles of Connected Learning Theory
Finding answers to similar questions; Focused on interest; Time and place availability; Engaging in content multiple times	<i>Engaging Formats</i>	Interest-Driven; Production-Centered
Value of connections; Ease of sharing links and information with others	<i>Increase Access to Knowledge and Information</i>	Academically-Oriented; Shared Purpose
Creation of PLC; Understanding a modern PLC	<i>Social Media Support</i>	Openly networked
Redefining expertise	<i>Diverse Range of Expertise</i>	Peer-supported

I could attend a conference while at home and it is amazing to think that I was able to make connections and learn professional development from the comfort of my own home.”

Learning engagement in the online PD environment opposed to the traditional one was described by the participants as higher in the online format. Traditional PD was described as typically not very exciting or interactive where participants often lose focus. Others explained that the online PD was engaging because they could come back to it and rewatch or relearn something: “If you listen to a presenter in traditional professional development, it is possible that they will tell you something interesting, and you may forget the information that they were talking about, but with an online experience you have the opportunity to refer back to the website to look at the information as often as needed.” Interest also could change over time and with online PD, the participants explained they could come back to the website and learn. Some suggested that they would like to have traditional PD “enhanced” by online PD, so that they could refer back to information when needed.

Increase Access to Knowledge and Information

Preservice teachers who assisted in the planning of the C2L Conference responded to questions about their involvement in the process. The consistent remark among all participants answering this question was they felt overwhelmed with the possibility of planning an online conference when they were first introduced to the idea, but as time passed and they approached it task by task, then they realized how much they had learned. That learning process was demonstrated in the many participants who

talked about how “planning the conference was a form of professional development in itself because I [they] collaborated with class members from different content areas to come up with ideas that are worth sharing with teachers.” Part of the planning meant they had to change their own views of PD; most of the participants explained they were thinking about teachers who would only have time to visit the online conference during their prep time or lunch break and wanted them to get as much information as possible in brief periods of time. To do that, they had to get creative with ways to compact quality information: “I was the bland “only-use-PowerPoint” type of preservice teacher. Now, I feel like a completely new person in knowing how to present information in an engaging way to other teachers!” These changes lead to pride in their work since “all the videos were created for teachers by a teacher.” Many believed the conference would have a lasting impact, and they were proud to be part of it: “Although there was a lot of work done by many people, this conference is something that will have an impact on many educators, not just those who submitted proposals.”

In addition to focusing on the planning part of the conference, the participants detailed how they told others about the conference. These interactions with other professionals in their network had positive effects on the participants; they believed in the quality of the conference and wanted others to experience this PD:

- “The site was easy to navigate and I told all my friends that work in the school system about the C2L Conference. I insisted that they log on and take a look. Many of my

friends have since contacted me and told me what a great site it is. They are using some of the ideas in their classrooms now. It is such a great feeling knowing that you are part of something that helps others in their classrooms.”

- “After mentioning the conference to several friends, which spans across three different states, they all had positive things to say about it. They could not believe that I actually took part in something like this. Many of them also mentioned the conference to several of their coworkers, and they viewed the conference as well.”
- “One of the things that a friend implemented in her classroom after viewing the conference was the use of QR codes in her classroom. It is something that she had been wanting to do but just never took the time to actually do it. She told me after viewing the QR codes section it gave her that push to do it. I helped with something that gave her that push!”
- “I happened to have been on the phone with my aunt who is Media Center specialist at a public elementary school in Miami, Florida. We began talking about what I was doing in class, and the topic of the C2L website came up. I explained to her what it was, when it would be launching, and how she could be a part of it to by submitting proposals when the website was up, and she was so excited. My aunt went on to tell her fellow educators about this, and now has my C2L sticker on her car!”

Support Through Social Media
A social media presence is built

into the C2L Conference. Beside each presentation on the C2L Conference website, the Twitter call sign is posted. Several preservice teachers work together to create Pinterest boards related to the conference, and they are pinning throughout the semester. Additionally, the C2L Conference has a Twitter and Facebook feed that is posting regularly about educational technology. Preservice teachers who were helping organize the conference create the social media posts.

Because of the connection to social media, participants were asked about any connections made as a result of the conference and their "eyes were opened to a whole new world of useful tools and advice." The Pinterest boards were mentioned in most responses as useful or helpful in finding resources or ideas, and most reported there were "so excited to use it in the future." When commenting on their use of Pinterest, they liked how "the tools, pins and websites [we] found can be applied to all sorts of classrooms and teachers." Participants did not talk about making connections with other educators directly through Pinterest; instead they saw the boards as a connection to ideas and information with numerous comments about how it "would be a wonderful tool for other teachers or other pre-service teachers to follow and use to their advantage."

Most participants reported making one or more connections through social media due to the conference: "One thing I loved about this conference is that for each video submission, there was a twitter call sign right around the video. This allows me to find the person that created the video on twitter and continue to connect with them on a personal level and allows me to connect on a professional level. I can connect with them on a profes-

sional level on social media because I can message them and ask them about other ideas that they have for the classroom. I can also see different links or ideas that they post using their social media. I know that I personally started to follow some of the people from the C2L conference to learn more about their ideas for education and the classroom." They are now following presenters on Twitter and explain they "now have a plethora of information at the click of a button. I [They] can go to any of these twitter pages and see if I find anything new, and that is really useful." Following presenters was common among the participants, but many also believed that these connections added to their PLC and remark, "they can easily be mentors for me through social media. The connection I've made with them will quickly build my professional development, and help me to find a job and to become a better teacher." By expanding the reach of their learning community, they were able to learn how to collaborate with other educators to learn new ideas or methods of teaching. Through such sharing, they talked about how they made connections with others based on similarities within the field: "I was able to see what it is like to contribute my ideas about technology and share them with other people that may have the same view as I did." The PLC was even expanded within their peer group because they were able to connect with them in a social media environment as well as face-to-face: "Following my fellow peers is helpful because these are the people I am learning with now and who I will be collaborating with in my field. They will be the people to turn to and grow from. Twitter helped me learn more about them and the messages they wish to spread in the world of education."

Diverse Range of Expertise

The C2L Conference only has one requirement for presentations; it must be connected to educational technology. Having a wide variety of teaching levels and content areas related to various technologies that can be used in the classroom allowed a more expansive way to do a conference. Members of the editorial review board view the presentations and choose which ones will be part of the C2L Conference, and they provide feedback to those who submit a proposal whether or not it is accepted for the conference.

The participants commented on the variety presents in the types of presenters, topics or strategies, and grade levels. They believed this variety would not be present in traditional PD: "This gives the people who want to view the presentations in the conference a wide variety of videos and information to view and to pick from, something one might not be able to do at a face-to-face professional development." The variety in presenters was important to participants because they believed it expanded their educational horizons. In traditional PD, the participants said they were not typically able to hear from teachers or preservice teachers in other areas of the country: "By participating in this conference, I was able to view people's presentations from all across the country thus furthering my professional development much better and quicker than if I had merely relied upon speaking to educators who resided in the same vicinity." By being able to connect with presenters from different content areas or grade levels, they found new ideas and "many new tools [I] did not know about before watching the conference because I usually don't work with anyone outside of my chosen area."

Further Implications

Further research could be done to examine learning results or actual application of learning between online and traditional PD. Ultimately, this research shows that PD can be enhanced or changed somewhat to accommodate our changing technologies. One participant explained how including such changes in PD made a difference: "Classrooms in 2015 are not the way they were in 2006. I was stuck in that 2006 classroom. I did not know about different technological uses until this conference. I do not want to be a teacher in 2006, I want to be a teacher in 2017."

Conclusion

Pre-service teachers expressed ease and convenience with an open-access venue to enhance professional development. As classrooms change, professional development styles should change to support teachers' instruction and students' learning. Professional development does not have to completely change, and not all PD is useful in an online environment, but this study demonstrates that online PD can be a useful tool in some situations and help teachers make connections they normally could not or would not make in traditional PD settings. Although this study has provided insights into pre-service teachers' use of PD it has only begun to unveil the importance and value of implementing and using modern PD methods.

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