

Teachers as Learners: What makes technology- focused professional development effective?

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Abstract: Prompted by calls for research on technology-focused professional development, this article investigates how learning communities influence secondary English teachers' use of digital tools. Findings from this year-long study in the United States indicate that the ways in which technology is integrated within the English curriculum are still very much dependent upon teachers' beliefs, values, and skills. This has particular implications in Australia, where the federal government is investing billions in educational technology in schools in line with broader education reforms, including the Australian Curriculum. This study suggests that technology integration can be supported by professional development that features: sustained dialogue around teachers' curricular goals and students' learning outcomes; hands-on learning with digital tools; the ongoing analysis of student work; and a view of knowledge as a social construction.

Introduction

Professional development, in theory and intention, provides teachers with meaningful opportunities to improve their instructional practices and raise student achievement. A substantial body of research has identified five core features of effective professional development, including a content area focus, opportunities for hands-on and active learning, coherence with previous professional experiences, involvement with colleagues from the same school or subject area, and a substantial duration of contact hours throughout the school year (Desimone, 2009; Desimone, Porter, Garet, Yoon & Birman, 2002; McLaughlin & Talbert, 2001). Despite the research on and investments in professional development, United States Secretary of Education Arne Duncan recently admitted, 'the bang we are getting for our buck is a disaster' (Calvert, 2010, n.p.). Consequently, a disconnect exists between research on professional learning, the allocation of funds to support teachers' growth and development, and the design of professional development in schools. This has particular implications for Australia, where the federal government is now investing billions in educational technology in schools in line with broader reforms, including the Australian Curriculum.

Despite initiatives such as the Digital Education Revolution in Australia and the National Educational Technology Standards in the United States, technology integration is not a simple process. In particular, short-term, workshop-based, and tool-focused professional development is still prevalent in many American schools (Harris, Mishra, & Koehler, 2009). These 'techno-centric' (Papert, 1990) approaches emphasise the affordances and constraints of digital tools rather than addressing how technology may enhance teachers' pedagogy or promote students' learning. Moreover, the design of such professional development does not provide teachers with the time and space to engage in open dialogue, sustained collaboration, and curricular innovation, all of which are critical components of successful professional development (Darling-Hammond & Sykes, 1999). Problems with technology integration are exacerbated by

'the paucity of empirical research examining the area of technology professional development for teachers, [which] is astonishing' (Lawless & Pellegrino, 2007, p. 584). Lawless and Pellegrino (2007) argue that we must move toward a more systematic way of studying professional development in order to understand what increases teachers' technology adoption and how this impacts students' school-based learning.

The present study

Drawing on research showing that sustained, content-focused professional development (Desimone, Smith, & Ueno, 2006) is associated with positive changes in instructional practices (Garet, Porter, Desimone, Birman, & Yoon, 2001), this study examined the design and implementation of technology-focused learning communities (Curwood, 2011). As a teacher educator and researcher, I designed and facilitated two learning communities at high schools in the United States. Participants included English teachers and library media specialists. Each learning community met regularly over the course of the 2009–2010 school year. During this time, we engaged in hands-on learning with digital tools, created technology-infused lessons, shared student artifacts, and reflected on our professional growth. We had two primary goals: First, we wanted to increase our knowledge of technology and its integration into the secondary English curriculum. Second, we sought to use technology to support student achievement and engagement. This kind of goal-oriented, sustained, and collaborative work is a cornerstone of professional learning communities (Cochran-Smith & Lytle, 1999).

Since sustained change in day-to-day practice is inherently local, learning communities serve a number of functions. McLaughlin and Talbert (2006) argue that 'they build and manage knowledge, they create shared language and standards for practice and student outcomes, and they sustain aspects of their school's culture vital to continued, consistent norms and instructional practice' (p. 5). In this sense, technology-focused learning communities can provide a context for teachers to collaborate with their colleagues in order to investigate how technology shapes student learning within the English classroom. At the same time, the structure of learning communities offers space for teachers to reflect on their instructional practices, technical skills and pedagogical beliefs.

This study seeks to add to the research on technology professional development by documenting effec-

tive *practices* that occurred within the learning communities. At the same time, this study highlights how teachers' *perspectives* and beliefs shape both technology integration and professional learning. This analysis focuses on the following questions:

- How can professional development provide teachers with a supportive environment to learn about technology and implement it into the English curriculum?
- What specific activities within professional learning communities promote teachers' technology integration?

Participants

This study used an ethnographic case study design. In order to address my research questions, I looked at multiple forms of data across time and space. While some forms of professional development are viewed as an end unto themselves, learning communities are conceptualised as an ongoing process. In that light, employing an ethnographic case study design allowed me to research how professional learning communities may capitalise on the socially situated nature of learning to foster technology integration as well as how such ongoing professional development can influence teachers' beliefs about and practices with digital tools.

Both of the research sites for this study, Avon and Milltown High Schools, are located within 25 kilometres of a large US Midwestern city. (All names of cities, schools, and research participants have been changed). Both sites can be characterised as technology-rich schools. At Milltown High School, participants included six English teachers and two library media specialists. Two teachers initially described themselves as tech-savvy, three said that they were average, and one called himself a digital immigrant. During the year of this study, 1,100 hundred students attended Milltown High School. In addition to 695 networked PCs, the school offered 30 iPod Touches, 10 iPod Nanos, and two iPads. This 1.6:1 ratio of students to computers is significantly lower than the US national average of 3.8:1 (National Center for Educational Statistics, 2005).

At Avon High School, five English teachers participated in this study. With one exception, all participants described themselves as novices with technology and only used it for the purposes of word processing, giving presentations, and creating blogs. One teacher had integrated other tools such as social bookmarking, collaborative writing, and video editing. Avon

High School had 1,500 students and 500 networked computers, with a 3:1 ratio of students to computers. Compared to nearby high schools, both Avon and Milltown had a higher number of computer labs, more recently updated hardware and software, and an increased use of interactive white boards and handheld devices. In addition, they had more support staff, such as library media specialists and technology coordinators, who are available and interested in working with classroom teachers to design, implement, and reiterate lessons that integrate technology. In Avon and Milltown, all students could readily access computers before, during, and after school.

Data sources and analysis

According to Lawless and Pellegrino (2007), research conducted on technology-focused professional development to date has yielded important information about the challenges of sustaining reform. However, researchers often failed to approach the study in a longitudinal manner and only reported 'data collected post hoc, after training had been developed and implemented' (p. 598). In this study, I employed qualitative research methods and collected multiple forms of data over the course of one academic year. For this analysis, I drew on several types of data, including 40 hours of video recordings of learning community meetings, field notes of my observations within the learning communities, audio recordings of two hour-long semi-structured interviews with each research participant, and teachers' mid-year written reflections.

I began by transcribing all video recordings of the learning community meetings and audio recordings from the interviews. I then imported these, along with teachers' written reflections and other collected artifacts, into NVivo, a qualitative data analysis tool. I used both inductive and deductive approaches to data analysis in order to identify key moments where teachers engaged with digital tools, shared innovative approaches to technology integration, and discussed their pedagogical beliefs. Throughout our work together, each learning community avoided taking a technocentric approach. Instead, we consciously worked to uncover the affordances and constraints of using technology within the English curriculum, to understand how digital tools influenced student achievement and engagement, and to critically reflect on our own thoughts about the role of technology in school and society. Due to the ever-changing nature of technology, both learning communities decided

to focus on free or low-cost digital tools available online, such as Google Docs, Diigo, Ning, Voicethread, Animoto, Glogster, Bubbl.us, and others. In the following section, I highlight three *practices* of the learning communities that provided opportunities for us to learn about digital tools and design technology-rich lessons within the English curriculum. Following this I discuss how teachers' *perspectives* on knowledge construction can shape technology integration.

Technology-focused learning communities: Practices and perspectives

Sustained dialogue around teachers' curricular goals and students' learning outcomes

Social interaction was at the heart of the professional learning communities in this study. By engaging in sustained dialogue, members of the learning communities had the opportunity to both learn from and learn with one another. However, it is not enough to just create space for dialogue in order to facilitate technology integration in schools. There also needs to be a conscious attempt to focus the dialogue on teachers' curricular goals and students' learning outcomes. In this study, teachers sought to increase their expertise with digital tools and their understanding of the role of technology in the contemporary English classroom. They then worked collaboratively to design innovative learning opportunities for students, share these within the learning community, and reflect on the outcomes.

Over the course of the school year, I found that discussion topics of the learning communities varied widely. Some days, teachers engaged in animated conversation about their own children's use of technology, frustrations with other professional development experiences, or concerns about particular students. As the facilitator, I would then ask myself: Does this topic relate to teachers' beliefs and values around literacy and technology? If the topic doesn't explicitly relate to teachers' curricular goals or students' learning outcomes, is it doing some other kind of *work*, such as building relationships or creating connections? Depending on the situation, I sometimes redirected the conversation to focus more on technology and secondary English pedagogy.

Within these particular social contexts, I found that when teachers focused on outcomes, it created a space where they could engage in 'back mapping'. Instead of focusing on a digital tool or a literary work, our process of back mapping started with student learning

outcomes. From there, we could consider how our own skills, available resources, and the school context could support those outcomes. The back mapping process helped to engage participants in sustained dialogue around learning, literacy, and technology. To begin the back mapping process, each learning community created a mission statement at the beginning of the school year. Mission statements consisted of four to six targeted statements that focused on student learning outcomes.

At Milltown High School, for example, teachers suggested that students should be able to 'engage in authentic work that reflects the learning process in relation to the curricular unit'. Prior to including this in the mission statement, we had to unpack the meaning of terms such as 'authentic work'. Figure 1 offers questions that the learning communities considered before, during, and after the use of technology-rich lessons. Notably, these questions avoid taking a technocentric approach by focusing on students' learning and teachers' instructional practices. The process of back mapping provided a way for us to engage in critical dialogue around the role of technology in the secondary English curriculum and its impact on student learning.

Back mapping process

Stage one

What do we want students to know and be able to do within the secondary English curriculum? What knowledge and skills do students possess in terms of literacy and technology?
What knowledge and skills are students lacking in terms of literacy and technology?

Stage two

What do we, as teachers, need to do to support students' learning outcomes?
How can technology shape students' engagement with the curriculum and with each other?
How can technology promote students' achievement in the English classroom?

Stage three

How did our creation, assessment, and implementation of this lesson shape students' learning?
How can we reiterate this lesson in the future in order to meet targeted learning outcomes?
What counts as successful learning with digital tools and in online spaces?

Figure 1. Back mapping process.

Hands-on learning with digital tools

Over the course of the school year, each professional learning community had the opportunity to engage

in hands-on learning with a variety of digital tools. We worked in pairs or in small groups to gain relevant technical skills, consider our learning process, and discuss how students could use this tool in a classroom setting. By focusing on the process of enculturation by which more knowledgeable members of a group engage in social mediation with novices, Vygotsky (1978) highlights the role that the community itself plays in an individual's meaning-making processes. When teachers engage in collaborative and hands-on learning, it acts as a form of enculturation to digital literacies (Curwood & Cowell, 2011). One teacher in Milltown, for instance, regularly participated in the learning community meetings but only integrated technology at the end of the school year when designing an incredible multi-genre project in response to Chinua Achebe's *Things Fall Apart*.

Lankshear and Knobel (2006) argue that ontology of digital literacies can be seen in both the 'new technical stuff' and the 'new ethos stuff' (p. 73). While the former focuses on digital tools, the latter emphasises the nature of learning and participation that can occur within and through such tools. Technocentric professional development, which is often marked by short-term workshops, focuses on the technical stuff to the exclusion of the ethos stuff. In order for teachers to effectively integrate digital tools into the English classroom they must possess relevant technical skills. However, they must also consider how technology can foster participatory learning, critical engagement, and distributed cognition (Gomez, Schieble, Curwood, & Hassett, 2010).

Within the learning communities, hands-on learning about technology involved reflection-in-action (Schön, 1983). In many ways, our meetings created space for teachers to pause and reflect on their own learning. In the middle of the school year, teachers completed written reflections (see Figure 2), which were used to consider teachers' instructional design and students' learning outcomes. One Avon teacher reflected on her use of an online discussion board to facilitate critical engagement with a novel in Advanced Placement English. At the end of the unit, she noted, 'I need to provide models, and I need to check in their work more frequently and giving feedback, potentially publically highlighting student responses in class as models to help show expectations'. Here, she attunes to the importance of modelling literacy practices in conjunction with digital tools. Schön (1983) notes, 'we reflect *on* action, thinking back on what we have

done in order to discover how our knowing-in-action may have contributed to an unexpected outcome' (p. 26). Simply put, technology integration requires that teachers have regular time to explore digital tools as well as the reflective space to consider how such tools impact their instructional practices and shape students' engagement and achievement.

Reflection

Reflection on Professional Learning

What new digital tools or technology-related lessons have you initiated this semester?

What positive learning outcomes result from these lessons? Were there any problems or challenges?

Did these lessons change your teaching strategies or your approaches to learning and assessment? In other words, did they buy you anything? Please explain.

Reflection on Student Work

Why did you choose this example?

Is it representative of student learning in this class? Why or why not?

In this example, do you feel the student(s) met your learning objectives for the lesson? Please explain.

How else might you design the lesson or scaffold students' learning to improve student outcomes?

Figure 2. Reflection questions.

An analysis of students' digitally mediated work

Holland, Skinner, Lachicotte, and Cain (1998) argue, 'the deployment of artifacts ... evokes the worlds to which they were relevant and positions individuals with respect to those worlds' (p. 63). Within professional development, artifacts may be created, critiqued, or analysed. As I participated in the learning community meetings, wrote field notes and memos, and analysed video and audio recordings, I found that student work, in particular, was an artifact that often served as a catalyst for teachers in terms of technology integration. Over the past decade, researchers have argued that when teachers share student work as part of their professional development, it makes their instructional practices public, enhances the quality of their teaching, and improves students' subject learning (Curwood & Gibbons, 2009; Kazemi & Frank, 2004; Little, Gearhart, Curry, & Kafka, 2003; Little & Horn, 2007). Kazemi and Hubbard's (2008) research on mathematics-focused professional development found that when teachers initially analysed student work, they could not identify students' learning strategies in detail or robustly discuss how to elicit students' thinking. Over time, however, teachers were able to work collaboratively and engage in such practices. This led

Kazemi and Hubbard (2008) to conclude, 'we need to understand how teachers make sense of these records and how the ways of knowing involved in collectively analysing depictions are connected to the ways of knowing teachers need to develop to be successful teachers' (p. 437).

As a facilitator, I tried to scaffold teachers' analysis of student work. First, I used the written reflection as a way for teachers to examine a specific artifact, identify evidence of student learning, and consider their instructional design. Next, I asked one teacher at each subsequent meeting to bring in an example of student work, share their thoughts, and reflect on their practice. In this study, the Avon learning community was much more receptive to sharing and analysing student work. While Avon teachers had less experience with technology at the onset of this study, they did have an average of 23 years of teaching experience. Within the English department, they often collaborated together and had previously participated in learning communities. Milltown teachers were more adept with technology and had an average of 11 years of teaching experience. However, they often seemed unwilling or even embarrassed to share student work. One Milltown teacher, for instance, quickly shared how her students used Google Maps as a tool to consider concepts like home, place, and memory before reading *To Kill a Mockingbird*. Rather than dwelling on students' maps, she said, 'Oh, that's not interesting' and instead noted difficulties with assessment. Cobb, Dean, and Zhao (2006) found differences in how teachers approach student artifacts. When teachers view student work solely as a tool for evaluation, for example, they then consider the analysis of student work within professional development to be irrelevant and unrelated to their classroom instruction. This means that facilitators may need to explicitly reorient teachers to the ways in which student work can be used to inform instructional design and technology integration.

A view of knowledge as a social construction

The previous sections focused on *practices* of the learning communities. Now I turn to participants' *perspectives*, which include their pedagogical beliefs. Ertmer (2005) argues that perspectives are the final frontier in technology integration. She notes, 'if we truly hope to increase teachers' uses of technology, especially uses that increase student learning, we must consider how teachers' current classroom practices are rooted in, and mediated by, existing pedagogical beliefs' (p. 36).

Teachers' beliefs were often shared explicitly in our meetings, but they also operated implicitly to shape how participants viewed the role of technology in the secondary English curriculum.

Some models of professional development present knowledge as a commodity, something that can be concretely identified, packaged, and delivered. Any failure to acquire that knowledge, then, was located with the recipient. This is in line with cognitive perspectives on learning. Palincsar (1998) explains:

While from cognitive perspectives, knowledge is generally represented in terms of cognitive structures that are acquired and organized in memory, social constructivists generally regard learning as the appropriation of socially derived forms of knowledge that are not simply internalised over time but are also transformed in idiosyncratic ways in the appropriation process. Furthermore, learning is thought to occur through processes of interaction, negotiation, and collaboration. (p. 365).

For teachers and teacher educators, a social constructivist view can inform professional learning as well as classroom teaching. Here, learning is conceptualised as an active, rather than a passive, process that depends on social interaction and multiple modes of representation (Hassett & Curwood, 2009). Notably, it includes artifacts, such as *student work*, that shape teachers' identities, perspectives, and practices.

Over the course of this study, I found that teachers sometimes framed technical skills as something that they needed to give to students. One veteran Avon teacher shared her uneasiness with social networking. Despite her own children's entreaties, she refused to join Facebook and said it 'created a panic' within her. Yet at the same time, she argued that she had an obligation to teach her students to use digital tools and social networks. She explained, 'I feel like, as a teacher, I need to teach kids how to use that so they won't be shut out from access to information'. By commodifying digital tools and their related practices in these ways, she neglected to consider students' prior knowledge with technology or create an environment where students were empowered to share their technical knowledge within the classroom. For some teachers, this scenario threatened their authority within the classroom. Collins and Halverson (2009) note, 'computers act to dilute the authority that teachers have in classrooms – especially the authority over what constitutes legitimate knowledge' (p. 41). When other teachers intentionally created a space where students'

technical skills were valued, they legitimised students' knowledge. As a result, they could then engage students in critical, metacognitive discussions about the role of digital tools in the learning process. More importantly, they situated knowledge as a social construction and it had direct implications for technology integration in the secondary English curriculum.

Conclusion

Research suggests that it is through *dialogue* that teachers are able to locate themselves in relation to the school environment, make sense of education reforms, and reflect on their experiences within a 'professional knowledge landscape' (Clandinin & Connelly, 1996). In this study, I found that it was important how teachers situated themselves within this landscape. Not only did this contribute to their perceived autonomy, it also shaped their professional identity. When two Avon teachers talked about being social learners, it served as an invitation to their colleagues to learn alongside them. When the head of the Milltown English department confided that, 'sometimes, it's easier just to sit and listen [in professional development]', it reinforced a passive view of professional learning. As a result, it is important to attune to how teachers position themselves as learners within a professional knowledge landscape. Do they see their own learning as an integral part of their professional identity? Does the school context create the time and space for teachers to engage in professional learning? And does the school culture value teachers' authentic, self-sponsored, and collaborative learning? While learning communities can provide teachers with hands-on, collaborative activities that foster technology integration, they can also provide space for teachers to consider their own identity and professional learning.

As a teacher educator, I entered this study aware of the differences between the learning communities: one primarily featured younger teachers who considered themselves tech savvy and the other included veteran teachers who had limited experiences with technology. While Milltown teachers explored a greater variety of digital tools and integrated them more frequently into their instructional practices, they struggled to analyse student work and consider the impact of technology on student achievement. For many Milltown teachers, their careers in the United States over the past decade have been marked by standards-based reforms, high-stakes assessments, and short-term professional development. On the other hand, Avon teachers had

over two decades of experience collaborating together, working within learning communities, and examining student work. While they had limited technical skills, they 'trusted the process' of professional development, as one teacher put it.

Coiro (2005) notes that the process of integrating technology into content area classrooms may take up to five years. Since most professional development focuses on the affordances and constraints of digital tools, teachers' effective implementation of digital tools in the English curriculum may take even longer. While this research study took place over a year, it may take much longer before teachers are able to embrace both the new 'technical stuff' and new 'ethos stuff' of digital literacies (Lankshear & Knobel, 2006). Research on technology-focused professional development can yield insights into the messy process of teacher learning. Teachers' sense-making processes, multi-faceted identities, and pedagogical beliefs shape the ways in which they use technology.

Learning communities, as a model of professional development, privilege teachers' engagement in interaction, negotiation, and collaboration. In Australia, the Standards for Teachers of English Language and Literacy (STELLA) values this model of professional learning and offers a rich generative framework which English teachers can readily use in conjunction with technology. This study contributes to our understanding of professional learning and argues that core features of effective technology-focused professional development include a sustained dialogue around teachers' curricular goals and students' learning outcomes; hands-on learning with digital tools; the ongoing analysis of student work; and a view of knowledge as a social construction. Future international research may focus on mixed method approaches to measuring teachers' adoption of technology and the direct effect on student achievement and engagement. This is particularly important as English teachers are 'unavoidably confronted by the question of how our teaching at a local level is situated within a larger social and educational framework' (Doecke & Parr, 2011, p. 15).

Over a century ago, Dewey (1904) was concerned with teachers' willingness 'to accept without inquiry or criticism any method or device which seems to promise good results. Teachers ... flock to those persons who give them clear-cut and definite instructions as to just how to teach this or that' (p. 152). As educators, we need to be wary of this tendency. Technology-focused professional development can highlight issues

of access, appropriation, and affiliation. It can embrace the notions of social constructivism, enculturation, and identity development. It can explore the role of technology in promoting student learning and creativity in an era of standards-based reforms. It can make our perspectives and beliefs visible – and perhaps, open to change.

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