Reinventing the 21st century educator: Social media to engage and support the professional learning of teachers

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Learning for the professions has grown beyond mere consumption of knowledge and become a knowledge creation process. The new effective teacher must think more about process than content, enabling learners to operate in the digital world rather than learn a discrete body of facts. The paper will present the teaching and learning possibilities accompanying the social, participatory and collaborative tools that have emerged in the Web 2.0 era. For beginning teachers, competence in e-learning and the capacity to employ these tools to support lifelong professional learning is essential. As technologies continue to change, there is a now a stronger emphasis on teacher learning and that is proactive, experiential and mediated by digital tools. The complexity of teachers learning and teachers' knowledge is acknowledged and theorised, and evidence is presented that digital tools and their affordances can enable and support teacher learning in a number of productive ways.

Introduction: Teacher knowledge and learning

With the growth and expansion of the Internet and social computing, digital tools are widely used to mediate social interactions and communication. Social networking sites, blogs, wikis, skype and virtual worlds are all part of suite of social- collaborative tools that enable communication and collaboration on a global scale. Extensive research indicates that these technologies are widely embraced and that the majority of students now own a mobile phone, PDA and laptop. Along with the universal and widespread integration of these tools in every transactions and socialization, there has been an increased focus on the importance of students learning social media skills and digital literacies (Siemens, 2007).

The aim of this paper is to identify essential aspects and processes relating to the professional learning of teachers, and what part digital tools may have in supporting teacher professional learning. The paper argues that there is enormous value in exploring the potential of web 2.0 tools for professional collaboration, inquiry practice, reflection and personalized learning. Several models of teacher professional development are explored in order to identify teachers' needs, showing how digital age thinking and networking have changed expectations of what it is to teach and learn in 21st century classrooms. There is currently little research that investigates how teachers learn with social media and digital tools. To address this gap, the paper considers pedagogical change and presents a number of teaching frameworks and models that can be mediated by web 2.0, enabling virtual communities of knowledge building. The paper also investigates the core components of these models and proposes that digital tools and their affordances can enable and support teacher learning in a number of productive ways.

Changing models of teacher knowledge and professional learning processes

Teacher knowledge is best seen as dynamic, and hence inseparable from the processes of learning and reflection. Professional learning in turn is an active, experiential process, through which knowledge is enacted, constructed and revised in a socio-cultural context. This does not however mean that teacher knowledge is only to be developed through experience and reflection. Hargreaves et al (2003, pages 197) commented that teachers are agents of change and that "teachers are having to learn to teach in ways that they have not been taught". Such skills can be developed through social negotiation processes, dialogue and reflection. Shulman's (1887) model of pedagogical reasoning was originally developed as a foundation for teaching reform. The model comprises actions that a teacher undergoes during the teaching process including comprehension of subject concepts, transformation of subject knowledge into teaching and instruction, evaluation of learning, reflection and new understanding of the learning process, self and the teaching process. The most original and significant part of Shulman's classification of teacher knowledge is the category of pedagogical content knowledge (PCK), indicating that teachers do possess a specialised knowledge base. As teaching continues to evolve, several researchers have revisited Shulman's model with a view to exploring how its relevance in the age of Web 2.0. Koehler & Mishra, (2009) have questioned the relevance of Shulman's (1987) model suggest changes to reflect the evolution of learning theory since that time. The original Shulman (1987) model is grounded in constructivism, while the revised model (Shulman & Shulman, 2004) includes connectivist approaches that assume that teachers create knowledge through connections in an open, digitally connected world where they operate in many overlapping communities. Teacher knowledge is therefore complex and multi-faceted, and the nature of teachers' professional learning needs to be made more explicit.

Models portraying the complexity of teacher learning

A number of models have been developed in an attempt to portray the complexity of teacher knowledge and learning, and all have overlapping features. These models are compared and summarised in Table 1. All three models recognise that teacher learning is multifaceted and dynamic, and that development of teacher skills and knowledge is highly interactive, individualised, socially mediated and metacognitive. Teacher learning and teacher knowledge are two sides of the same coin: the former involves active, experiential activities and through the processes of engagement and learning, knowledge is created, enacted, considered and revised. Pedagogical thinking is subject to many different influences and factors, and is a constant interplay between formal and informal learning, personal constructs and professional expectations, objective and subjective experiences. Therefore, the development of professional skills and competencies is very much an individual learning trajectory, and that it may be enabled by interplay of factors, including practical experience and participation in communities of practice. In the following section, the five competencies described by Shulman & Shulman (2004) as reflection, vision, community, capability, motivation, will be considered in the context of how digital tools can be used to mediate and to support teacher learning.

Table 1: Comparison of models of teacher learning

Theorist and model	View of the teacher	Type of knowledge
Banks, Leach & Moon (1999) [Four categories of teacher knowledge]	• Teacher seen as knowledge professional • Complex and individual	• Subject knowledge • School knowledge • Pedagogic knowledge • Personal constructs
Hoban (2002) [Professional learning System]	• Teacher knowledge as a dynamic and constant construction	• Transformative and generative
Shulman & Shulman (2004) [Ready, willing and able]	• Having vision, reflection, motivation, community, practice, understanding	• Ready (having vision) • Willing (motivated) • Able (knowing and begin able to do)

Affordances of digital tools and social media

Given the affordances of digital technologies how might we best apply web 2.0 tools and social media in developing professional knowledge? Similarly Burden (2010) asks the question "Which aspects and affordances of Web 2.0 technologies are capable and suitable for mediating the elements of professional learning. Social media and Web 2.0 can be seen as tools which afford learners the potential to engage in meaningful activities for learning. Such activity may be autonomous or collective, and can encourage communication beyond text-based media with easy publication of user-user created resources. Stimulating enquiry, supporting collaboration, engaging with new literacies and generating multimodal artefacts are all novels ways of developing knowledge and comprehension. The use of Web2.0 tools can enhance users' abilities and enable collaboration, collective knowledge building and exchange of ideas. Several views of the affordances of Web 2.0 tools show the capacity for participatory, community building experiences. For example McLoughlin & Lee (2007, p.3) note how blogging empowers learners to express their views and explore others' They identify the following categories of 'affordances' associated with Web 2.0 or social software:

- Connectivity and social rapport
- Collaborative information discovery and sharing
- Content creation
- Knowledge and information aggregation and content modification.

They also make the crucial point that social software affordances do not, by themselves, guarantee that effective learning and reflection will occur. This requires 'careful planning and a thorough understanding of the dynamics of these affordances' (2007, p.4). It is therefore useful to weave together particular types of Web 2.0 affordances with the opportunities for learning that they might offer, and to provide exemplars of tasks. A useful way viewing this is to present a number of purposeful activities with the affordances of Web 2.0 (Fisher, 2006). These activities are not discrete, but are rather overlapping and interwoven (See Table 2).

Table 2: Linking meaningful/purposeful activity with affordances of digital tools

Distributed Cognition	• Accessing resources • Discovering and inquiring • Composing, creating and presenting multimodal texts with digital tools
Engagement	• Playing and exploring uncertainty • Taking risks • Responding to immediacy • Learning though multidimensional interactivity
Knowledge creation	• Creating and adapting ideas in dynamic ways • Modelling • Representing ideas in multimodal forms
Community and communication	• Sharing ideas and resources • Engaging in reflective dialogue • Participating in local and global communities

Burden (2010) gives some examples of how Web 2.0 tools such as wikis and virtual worlds can be used to support teacher professional learning. Collaborative wiki learning environments can be created by teachers to explore, write and share their perspectives on a particular pedagogical problem. The wiki space provides an alternative context for learning and reflection where the teacher is freed from the constraints of the staff room and classroom and is afforded the space to articulate and share ideas. In addition, participation in wiki is a self-generated form of professional learning and can bring the teacher into global networks for sharing ideas. Teacher learning through experience and construction in virtual worlds and 3D VLEs is enabled by the provision of alternative learning spaces which provide participants with "the ability to explore, construct and manipulate virtual objects, structures and metaphorical representations of ideas" (Dalgarno &Lee, 2010, p. 11). These authors identify five specific affordances that 3D VLEs might generate for learners:

1. spatial knowledge representation;
2. experiential learning;
3. engagement;
4. contextual knowledge; and

5. Collaborative learning.

Each of these affordances might generate a learning task that correlates with the aspects of professional learning identified by Shulman & Shulman (2004: Table 3). The potential of virtual worlds such as Second Life to host alternative learning experiences for teachers is gaining momentum as the learning process is highly experiential and engaging. Such examples show that these digital tools can be integrated into models of professional learning for teachers. Three different models of teacher professional learning are those of Hoban (2002), Banks Leach &Moon (1999) and Shulman & Shulman (2004). The latter describe teacher competencies as "ready, willing and able" and its aim is to assist in identifying and explaining teacher learning in a more explicit manner. As this model encapsulates the core ideas of Hoban (2002) & Banks, Leach & Moon (1999) it can explain how digital tools can mediate and develop the attributes of vision, motivation, understanding, practice and reflection and community. According to Shulman & Shulman (2004) the accomplished teacher must have vision, a clear sense of classrooms as learning communities and motivation. In teacher education, vision means having a view on the purpose of education within society; a philosophy of learning and teaching; and positive proactive view of their own professional learning. The affordances of digital tools and social media have, and continue to have, a major impact on the social, economic and cultural aspects of society and education. Web 2.0 tools can support the dimensions of an accomplished teacher outlined by Shulman & Shulman (2004), by enabling networking practices, information sharing, distributed learning and content creation.

Conclusion

This paper has outlined the various processes that underpin teacher learning within a broadly situative perspective based on socio-cultural views and theories of learning. Key features or affordances of Web 2.0 technologies are identified as being particularly valuable and harmonious with teacher learning, even though most of these applications were not designed originally for teacher education or even education in the wider sense: Innovative practices supported by social media provide an opportunity for teacher educators to look at wider implementation issues around technical infrastructure, but they must also address pedagogical challenges such as the integration of informal learning experiences, the limitations of existing physical and virtual learning environments and the personalisation of learning experiences. There may be a culture shock or skills crisis when "old world" educators are confronted with the expectation of working with participatory web 2.0 tools, and technologies with which they lack expertise and confidence. For these reasons, there is a need to make time for talking, awareness raising, and discussion of what pedagogic approaches and tools best support the key competencies identified by Shulman & Shulman (2004). The goal is to facilitate learning, to blend the formal and informal, to support knowledge building and distributed cognition and engagement. The affordances of web 2.0 tools and digital technologies can support the growth of a reflective learning community to enable critical dialogue and communication while nurturing creativity, independent inquiry and communication. This can be achieved by employing the tools, resources and opportunities that can leverage what teacher do naturally – socialise, network and collaborate.

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