This is a preprint of:
Kirschner, P. A., & Wopereis, I. G. J. H. (2013). Do you know the way to ... Web 2.0? In J. M. Spector, B. B. Lockee, S. E. Smaldino, & M. C. Herring (Eds.), *Learning, problem solving, and mindtools: Essays in honor of David H. Jonassen* (pp. 88-104). New York, NY: Routledge.

Chapter 6: Mindtools for Teachers

Do you know the way to...Web 2.0?

Paul A. Kirschner & Iwan G. J. H. Wopereis
Open University of the Netherlands
Centre for learning Sciences and Technologies
paul.kirschner@ou.nl, iwan.wopereis@ou.nl

Abstract

With the coming of age of the Millennials, teacher training programs may become complacent, thinking that while the previous generation of digital immigrants that went into teaching may be a lost cause, things will now be different with the influx of digital natives into the teaching profession. This, however, is anything but true. Though Millennials may never have known anything except a digital, connected world, they appear to have precious little knowledge of how the attainments of the digital world can be used – as mindtools – in education. Programs for teacher training, thus, still need to train

(aspiring) teachers make use of both traditional and Web 2.0 information and communication technologies as mindtools for themselves and their students. On the one hand, teachers can use these tools to engage their students in individual, collaborative and collective critical thinking and knowledge creation activities. On the other hand, they can use them themselves to help further their own professional development and thinking. In the latter case mindtools can be applied for cooperation (e.g., between teachers, teacher educators, and student teachers) and collaboration (e.g., with other teachers, experts, designers, and so forth on pedagogical projects). In this chapter we focus on electronic networking technologies (Communities of Practice) and Web 2.0 applications (e.g., weblogs) as mindtools for teacher professional development.

Keywords

Millennials: those who were born into an environment where computers and the Internet were present; roughly, those born after 1982 in developed countries; also known as digital natives.

Mindtools: computer-based tools designed to promote higher-order, critical thinking.

Web 2.0: second generation Web pages and tools that typically involve interactive pages and support participation and sharing of information and resources.

Begin at the Beginning: Some Definitions

Millennials

Marc Prensky (2001) coined the term *digital native* to refer to a group of young people who have been immersed in technology all their lives, giving them distinct and unique characteristics that set them apart from previous generations and who have sophisticated technical skills and learning preferences for which traditional education is unprepared. He coined the term not based on research into this generation, but rather by rationalizing phenomena that he observed (e.g., he saw kids "surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (2001, p.1) and assumed (a) that they understood what they were doing, (b) were using the artifacts effectively and efficiently, and (c) that it's good to design education where they can do this. Veen and Vrakking (2006) followed suit, introducing the term *Homo Zappiens* to refer to a new generation of learners who learn in a significantly different way than their predecessors.

These terms are comparable to others given to a generation that has never known a world without computers, mobile phones and the Internet such as the Net generation (Oblinger & Oblinger, 2005; Tapscott, 1997), Generation I or iGeneration (Rosen, 2007), Google® Generation (Rowlands et al., 2008), and so forth. The most generic term for this group is possibly the *Millennial Generation*, which does not denote a specific age group but rather a generation of characterized by high level use of and familiarity with communications, media, and digital technologies. According to Veen and Vrakking (2006), children of this generation develop – on their own and without instruction – the metacognitive skills necessary for enquiry-based, discovery-based,

networked, experiential, collaborative, and active learning along with self organization, self regulation, and problem solving skills, and who are capable of making their own implicit (i.e., tacit) and explicit knowledge explicit to others.

Unfortunately, research has shown that this information technology savvy generation really does not exist, at least with respect to learning, learning tools, and mindtools. Margaryan, Littlejohn, and Vojt (2011), for example, reported that university students (i.e., Millennials) use a limited range of technologies for learning and socialization: "…the tools these students used were largely established technologies, in particular mobile phones, media player, Google®, Wikipedia®. The use of handheld computers as well as gaming, social networking sites, blogs and other emergent social technologies was very low" (p. 438). A number of research studies (Bullen, Morgan, Belfer, & Qayyum, 2008; Ebner, Schiefner, & Nagler, 2008; Kennedy et al., 2007; Kvavik, 2005) in different countries (e.g., Austria, Australia, Canada, Switzerland, the United States) question whether the Homo Zappiens and/or Digital Native really exists. These researchers found that university students do not really have deep knowledge of technology, but that this is often limited to basic office suite skills, emailing, text messaging, Facebook® and surfing the Internet. According to Bullen et al., "…it appears they [university students] do not recognize the enhanced functionality of the applications they own and use" (p.7.7) and that significant further training in how technology can be used for learning and problem-solving is needed. When used for learning, this was mostly for passive consumption of information (e.g., Wikipedia®) or for downloading lecture notes. A report commissioned by the British library and JISC (Williams & Rowlands, 2007) also overturns the common assumption that the Google generation is the most web-literate.

Rowlands et al. (2008) conclude: "…the main findings are that much professional commentary, popular writing and PowerPoint presentations overestimate the impact of ICTs on the young, and that the ubiquitous presence of technology in their lives has not resulted in improved information retrieval, information seeking or evaluation skills." (p. 308).

Related to this, a recent study by Valtonen, Pontinen, Kuokonen, Dillon, Väisänen, and Hacklin (2011) under what they called Finnish Net Generation student teachers (i.e., student teachers born in the period 1984-1989) showed "that the technological knowledge of student teachers is not what would be expected for representatives of the Net Generation" (p.13-14). In the study, they explored the technological pedagogical knowledge which they defined as the "an understanding of the benefits and disadvantages of various technologies related to different pedagogical aims and practices" (p.7). While it was expected that these Net Generation students would be adept at learning through discovery and thinking in a hypertext-like manner (Oblinger & Oblinger, 2005; Prensky, 2001) and that they would be able to transfer those skills to their teaching practices upon entering the teaching profession (Prensky), the results showed, just as the results of Margaryan et al. (2011) and Bullen et al. (2008), the range of software used was very limited and that, for example, the use of social media was as a passive source of information and not to actively create content, interact with others, and share resources. Valtonen et al. (2011) conclude that the expectations and assumptions about this group of "student teachers' abilities to adopt and adapt ICT in their teaching are highly questionable" (p.1).

Mindtools

According to David Jonassen (2000) mindtools are "computer-based tools and learning environments that have been adapted or developed to function as

intellectual partners with the learner in order to engage and facilitate critical thinking and higher order learning." (p. 9).

Learners constantly use applications such as databases, spreadsheets, search engines, visualization tools, and conversation environments which have been developed as aids in the execution of work; to make users more productive. These tools we call productivity tools. When used as a mindtool, databases – for example - can help learners integrate and interrelate discrete bits of content, making them more meaningful and more memorable. Building a database requires learners to organize information by identifying relevant content dimensions. In using a spreadsheet, learners can design, use, and fill in values and formulas requiring them to use existing rules, generate new rules to describe relationships and organize information, thus engaging critical thinking, forcing them to think more deeply (Blignaut, 1999; Jonassen & Carr, 2000). In this situation such applications have also been referred to as cognitive technologies (Pea, 1985), technologies of the mind (Salomon, Perkins, & Globerson, 1991), cognitive tools (Jonassen & Reeves, 1996; Lajoie, 2000) or tools for thinking / tool[s]forthoughts (Williamson Shaffer, 2009).

We broaden the scope in this chapter to include the facilitation of work by knowledge workers such as teachers and aspirant teachers. Since critical thinking and higher order learning also are necessary in their work, mindtools are also intellectual partners with these professionals whose working and learning are intertwined. Teachers must continuously develop themselves and learn and in this learning process, mindtools can play an important role. Teachers and aspirant teachers must therefore learn how to use mindtools both

as a means to encourage constructive learning in the classroom and as a tool for their own professional growth.

Web 2.0

Since its introduction in the early nineties of the last century, the World Wide Web or 'Web' has developed from a static set of reference pages into a dynamic programming and application hosting environment. Terms like 'Web 1.0' (Cormode & Krishnamurthy, 2008), 'Web 1.5' (Dron & Anderson, 2009), 'Web 2.0' (O'Reilly, 2007), 'Web 3.0' (Morris, 2011) and 'Web Squared' (O'Reilly & Battelle, 2009) underline the progressive nature of the evolving Web, even suggesting some kind of evolutionary stage model. Although there is a lot of criticism regarding the software versioning way of denoting Web development (since its inception, the Web has not been updated in a technological sense), we cannot neglect this terminology, simply because of its widespread use in all kinds of information and communication sources. A traditional Google search on the aforementioned terms performed on January 10, 2012, for instance yielded approximately 3,060,000 ("Web 1.0"), 766,000 ("Web 1.5"), 117,000,000 ("Web 2.0"), 4,500,000 ("Web 3.0"), and 120,000 ("Web Squared") hits respectively. Based on these results it is obvious that the contemporary world is essentially dealing with second generation Web tools and applications. It is the crowd that talks the talk; we will walk the walk and describe the second generation technologies in the context of learning and professional development.

According to Wikipedia®, the term Web 2.0 is "associated with web applications that facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web." It is often referred to as 'read/write Web' for so-called 'prosumers' (producer-consumers) to emphasize easy-to-use services regarding the creation and

publication of content on the Web (as opposed to the preceding ‘read-only Web’ for ‘consumers’; cf. Greenhow, Robelia, & Hughes, 2009). Also the term ‘social Web’ is frequently linked to Web 2.0 as it stresses the opportunities to co-create and share knowledge and meaning with others in a social way (Boulos & Wheeler, 2007; Kim, Jeong, & Lee, 2010).

Dede (2009) analyzed the proliferating collection of Web 2.0 applications with respect to purpose, resulting in a three-group classification. He distinguishes between applications for (a) sharing, including applications for communal bookmarking, photo and video sharing, social networking, and writers’ workshops and fan fiction; (b) thinking, including applications like weblogs, podcasts, and online discussion forums; and (c) co-creating, including applications like wikis and collaborative file creation, mash-ups and collective media creation, and collaborative social change communities. According to Dede, this categorization by purpose can be helpful for assessing the differential utility of applications in formal learning contexts and beyond. This is necessary, since education is struggling with the implementation of Web 2.0 technologies in the classroom. Ravenscroft (2009, p. 2) for instance signifies an interesting paradox, “levering around the notion that we are trying to incorporate the open, opportunistic and radical into a set of broader practices that are highly structured, time-constrained and quite traditional.” For Web 2.0 to be successful in education, traditional views on pedagogy must change (Brown, 2012). Some believe that Web 2.0 gears a wished for paradigm shift in pedagogy necessary for ‘riding the wave’ of technological and societal change (Brown, 2012). The term Pedagogy 2.0 (McLoughlin & Lee, 2008) points to serious efforts to enhance learning with new technologies. Examples provided by aforementioned scholars make clear that Web 2.0 technologies affording interconnectivity, content creation and remixing, and interactivity

can be successful on condition that learners are not left to their own devices (cf. Kirschner, Sweller, & Clarke, 2006). Thus, for educators it will be a challenge to fully embrace Web 2.0 philosophies like openness, collective intelligence, and transparency. The least one can do is to 'design' adequate support for learning (cf. Jonassen, 1999) and additionally focus on the development of new literacies that feature terms like 'digital, pluralized, hybridized, intertextual, immediate, spontaneous, abbreviated, informal, collaborative, productive, interactive, hyperlinked, dialogic, and linguistically diverse' (Mills, 2010, p. 255).

Characteristics of Mindtools

David Jonassen (2000) distinguished five *characteristics* of mindtools. Perhaps a better term is *affordances* of mindtools; the perceived properties of a thing in reference to a user that influences how it is used (Kirschner, 2002). Originally proposed by James Gibson in 1977 (and refined in 1979), an affordance refers to the relationship between an object's physical properties (artifacts) and the characteristics of an agent (user) that enables particular interactions between agent and object. Affordances, thus, offer the user opportunities to do something; whether the opportunity is seized depends on the user.

First, mindtools afford *cognitive amplification and reorganization* allowing the user to exceed the limitations of the human mind by doing things more accurately and at a higher speed. Engelbart (1962) spoke of augmenting human intellect:

> Increasing the capability of a man [*sic*] to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems. Increased capability in this respect is taken to mean a mixture of the following: more-rapid comprehension, better comprehension, the possibility of gaining a useful degree of comprehension in a situation that previously was too

> complex, speedier solutions, better solutions, and the possibility of finding solutions to problems that before seemed insolvable. (p. 1)

Using the term intelligence amplification, Kirschner and Wopereis (2003) described this as the humans and machines working together to do things neither could do alone. It does not make things easier, but rather makes things possible.

Second, mindtools are *generalizable* and can be used is various settings and domains to engage and facilitate cognitive processing. They are not specific to any one purpose nor do they reduce information processing. They do not make processing easier, but afford it / allow it to occur. This also means that users have to think harder since to think more deeply costs more effort.

Mindtools, thirdly, can afford *critical thinking*, helping users think for themselves, make new connections between concepts, and create new knowledge. This is similar to what Crombag, Chang, Drift, & Moonen, (1979) referred to as carrying out operations on knowledge as opposed to operations with knowledge.

Mindtools are also *intellectual partners* in the learning of working process. As such, they are responsible for that which they can perform best. Computers should calculate and store and retrieve information, while the user of the tool should be responsible for recognizing and judging patterns of information and its organization.

Finally, a mindtool is a *concept*. It is a way of thinking about and using ICT, other technology, the learning environment, or intentional and incidental learning activity / opportunity (constructivist in nature) so that the users of

these tools can represent, manipulate, and reflect on what they know instead of reproducing what others tell them.

The distinction between productivity tools and mindtools is comparable to Salomon's (1995) distinction between effects *with* technology and effects *of* technology. Effects *with* technology and/or tools relate to what happens while one is engaged in working with ICT and/or while she/he is busy with the tools. An example of effects with technology can be seen as the changed quality of problem analysis and solution as a result of either working with a group decision support system with others or that a specific project is delivered on time because of the use of project planning software. They are short-term changes induced by and/or effects of the technology or technology tool. Effects *of* technology and/or technology-tools on the other hand are those longer lasting changes that are a result of working with technology or are the result of having made use of the tools. An example of the effect of technology could be the skill of asking more exact and explicit questions because of the experiences working with the group decision support system. An effect of the planning software could be that the person becomes better able to plan and execute a project (i.e., that she/he plans and works more effectively and efficiently at a later date and without the tool) due to earlier use of and experience with the project planning software. Salomon argues that education should emphasize attaining effects of and not just effects with tools.

Used as productivity tools, we speak of the effects obtained with a program or application. Used as a mindtool, we speak of the effects of the program or application.

Teacher Communities of Practice

Teaching is a strange profession for a number of reasons. First, though the teaching profession is dedicated to education and learning, it strangely enough does not have a universal policy of continuing certification. Once you have become a teacher and receive your permanent certification, you no longer need to recertify. Second, though the profession itself is segmented into natural communities (e.g., school districts, schools, school types and levels, subject areas, and so forth) teachers tend to work in a solitary way (e.g., each teacher rules her or his little kingdom). Finally, they are possibly the only knowledge professionals who do not have their own personal space at their place of work. They share their classrooms with their pupils, often do not have their own desk with computer, and lack the 'down time' in the course of the working day (i.e. their 'free time' during the day is usually filled with administrative or other school-related duties). There is, however, a mindtool that may help here: the *Community of Practice*.

Many people might not think of a CoP as a mindtool, but CoPs actually conform to all of the characteristics of a mindtool. First, a CoP affords *cognitive amplification and reorganization* in that the sum of its participants far exceeds the limitations of a single human mind. Second, CoPs are *generalizable*, A CoP can be set up and used in many settings and is not domain specific (e.g., anywhere from baking to ADHD to quantum astrophysics) to engage and facilitate cognitive processing. CoPs also can afford *critical thinking* in that they can help users think for themselves, make new connections between concepts, and create new knowledge. CoPs can also be considered to be *intellectual partners* in the learning of working process. Persons in CoPs assume different roles in different situations (as one moment a student teacher can be a learner and at another moment can advise another)

with participants taking responsibility for that which they can perform best. Finally, a CoP is a *concept*. It is a way of thinking about and using the knowledge and experience of others so that members of the CoP can represent, manipulate, and reflect on what they know and not just reproduce what others say.

Communities of practice are groups of people who share similar goals and interests (CoVis). In pursuit of these goals and interests, they make use of common practices, use the same tools and express themselves in a common language. Through such common activity, they come to hold similar beliefs and value systems. Teachers belong to a large community of practice (the worldwide community of teachers) and almost always to one or more sub-communities such as the community of teachers in Iowa or the Netherlands, the community of science teachers, the community of elementary school teachers, the community of special educators or even the community of teacher educators.

According to CoVis (adapted from Lave & Wenger, 1991; Edelson, Pea, & Gomez, 1996)

> part of belonging to a community of practice is being aware of the range of goals and beliefs held, as well as techniques used, by community members at large. Some of these will be part of the practice and belief system of a large number of the community members. Some will belong to a minority of the membership, or "fringe" groups. Awareness of the community debates and contentions is as important a part of community membership as awareness of what is common to most, or all. It is not unusual in some communities for such debates and contentions to be a key component of what drives community activity and the evolution of that activity over time (p. 4).

Schaap, de Bruijn, van der Schaaf, and Kirschner (2009) refer, in this respect, to the individual development of a Personal Professional Theory of the profession and note that this needs to be tuned to the Group Professional Theory. In this, communication and conversation with other members of the community and its sub-communities is of the utmost importance.

According to Barnett (2002), network-based technologies have had an impact on teacher professional development in that it has reduced teacher isolation, has supported sharing, and has fostered reflection on practice. To this end, it has influenced actual practice and played a role in the creation of communities of practice. These technologies allow pre-service and novice teachers to access a distributed expertise from more experienced teachers, teacher trainers and university faculty. In communities of practice, network-based technologies can make sustained support available to these teachers, even after they themselves have become experienced teachers (i.e., in a community of practice there are no general experts; each participant can be a learner in one situation and an expert in another). They allow teachers to share teaching experiences and techniques with others, get feedback so that they can modify their actions, methods and curricula, and hear of and learn from the experiences of others, and learn of new techniques (e.g., strong points, weak points, and implementation problems). Such interaction, according to Schlager, Fusco, and Schank (1999), can play a key role in innovating education.

In the following section we will present the role of conversation tools in these communities and illustrate how this can be learnt based upon examples of good practice in teacher training.

Conversation Tools as Mindtools

Conversation tools encourage and support discussion and discourse, allowing meaningful conversations that can lead to knowledge co-construction. These tools can be synchronous (communication with others within the community at the same time and in real-time as in Skype® or a chat tool such as MSN Messenger®) or asynchronous (communication with others within a community at different times as in e-mail or a discussion board). The first category allows people to share information (different types of data, thoughts, ideas, et cetera) with each other, process it, and discuss it at the same time. Asynchronous communication involves delayed communication where only one person can communicate at any one time and there can be a considerable delay between communications of the different users. Jonassen (2000) distinguished three types of asynchronous conferencing:

- one-to-one communication as in e-mail (though email also allows for one-to-many communication),
- one-to-many communication as in bulletin boards (special-purpose computer programs that enable individuals to post messages to a bulletin board or read messages and copy them to a computer), and
- many-to-many communication as in computer conferences (asynchronous discussions, debates, and collaborative efforts among a group of people who share an interest in the topic).

Conversation tools can support communities or networks for the professional development of (aspirant) teachers. These communities for the professional development of teachers can differ with respect to a number of variables and these differences will manifest themselves in the use of different types of conversation tools. Three major differences are: the size of a community, the setting where the community operates and the composition of a community. Biology teachers, for example, who want to make use of mindtools in their

teaching of biology to their pupils may form a special-interest discussion group in a news group. These teachers can be regarded to be a relatively small homogenous discourse community. This same topic (mindtool use in biology) may also be the subject of discourse in a learning community with aspiring biology teachers (i.e., student teachers), teacher educators, and experienced biology teachers. In such a community, the group is larger and also heterogeneous with respect to both expertise and domain of professional specialization. Size and heterogeneity could be further increased when domain experts (e.g., biologists, biomedical researchers, members of allied fields, et cetera) are added to the community of practice where biology is binding factor.

An example of a widely used and mature community of practice that makes use of network based technologies is *La Main à la Pâte* (Hands-on Work), in which a community of practice for science teachers is formed throughout France. This community won the 2001 eSchola prize for best initiative for teachers.

[INSERT FIGURE 1 ABOUT HERE]

Figure 1: Opening page of La Main à la Pâte (http://www.lamap.fr/).

Initiated in 1996 by Georges Charpak, Nobel prize winner for physics in 1992 this community is managed by the French Academy of Science. It is based on teachers networking their skills to create effective synergy with external actors, inspectors and educational advisers, College of Education Training Staff, teaching specialists in science and other subjects, scientists, researchers, engineers, students from science universities or from the national colleges, and

parents. In April 1998, an Internet site was opened offering teachers an information section on the structure and history of the project, a resource section containing class activities, scientific documents, and educational documents, and an exchange section with access to training and scientist networks, to (sub)sites of the *La main à la pâte* network, and to archives of a distribution list.

The networks are set up to foster exchange and cooperation between the different actors involved in the teaching of science, inter-teachers dialogue, and teacher-teacher assistance. Two important networks within the exchange section are the scientific consultant network and the teaching specialist network. Dialogue within these networks is achieved through asynchronous, built-in conversation tools with the results classified by both topic and resource-form. The scientific consultant network is a constantly expanding network made up researchers and engineers who are willing to help (i.e. act as a resource or sounding board) teachers. They, in their own area of competence, reply to science-related queries by teachers preparing or implementing an activity. Replies are generally received within 48 hours. The teaching specialist network is made up of trainers and researchers skilled in the teaching of an academic subject (i.e. the pedagogical content knowledge of a certain area). These community members aid teachers to solve those problems encountered when preparing or conducting science activities.

Weblogs as mindtools

A *weblog* or '*blog*' is a frequently updated personal website with dated entries displayed in reverse chronological order (i.e., newest / most recent first). Such entries or 'posts' can easily be commented on, offering opportunities for discussion and feedback. As a weblog 'grows', older posts and accompanying

comments gradually disappear from the main page into an archive. Access to this archive is guaranteed, since each post has a unique resource locator called 'permalink'. In addition, *tags* (i.e., non-hierarchical keywords or terms given to a piece of information that makes them easier to find) can be added to posts, aiding categorization and retrieval of content. Both weblog readers and writers (bloggers) can easily search through this (categorized) content by means of hyperlink navigation and keyword search. Further, when readers make use of web syndication technology (e.g., RSS: Really Simple Syndication), they are notified when weblogs are updated, allowing both knowledge of and adequate responses to new content.

The aforementioned functionalities combined with technological features that enable tool ownership and user-friendliness make weblogs popular tools for recording, sharing, and discussing information. Although not as trendy as in the previous decade, weblogs can still be regarded mainstream Web 2.0 tools. On January 11, 2012 BlogPulse Stats for instance identified 182,297,340 weblogs world-wide, including a growth of 100,897 new weblogs in the preceding 24 hours. Based on its popularity as a leisure tool, it is not surprising that educators consider implementing weblogs in formal education. Luehmann (2008) identified several affordances of weblogs for formal learning. According to her, weblogs (a) allow for self-direction, (b) provide rich opportunities for reflection and meta-cognition, (c) invite perspective making and taking through interacting with an audience, (d) allow for knowledge brokering, and (e) support identity development. These affordances strongly relate to the results of a literature review on weblog use in higher education conducted by Sim and Hew (2010). They identified six uses of weblogs from which instances can come across concurrently in a single weblog. They found that weblogs were mainly employed as (a) learning

journals or knowledge logs for gathering relevant information and ideas pertained to specific topics; (b) tools for recording personal and everyday life; (c) tools for expressing emotions or feelings; (d) instruments to interact or communicate with fellow students or teacher; (e) tools for (formative) assessment of learning, and (f) tools for task management.

We consider weblogs Mindtools, especially when they are used as learning journals or knowledge logs. Although not mentioned as such in the work of Jonassen (1996, 2000, 2006), we are of the opinion that weblogs can be regarded intellectual partners that facilitate critical thinking and higher order learning (see also Boulos, Maramba, & Wheeler, 2006). Weblogs defined as mindtools include collections of posts and comments that reflect someone's history of learning. Weblog users can act on this content, discuss it, reflect on it, and compare it with other (expert) knowledge in order to continue learning. In other words, they can be used as / are tools to allow teachers to be or become reflective practitioners. The effect of these activities will be enhanced when weblogs are situated in a larger community where the 'wisdom of the crowd', and/or –even better– the 'wisdom of experts' can be tapped. In his latest book on mindtools, Jonassen (2006) emphasizes that mindtools should focus on the process of conceptual change, a mechanism underlying meaningful learning. According to him "[o]ne of the most powerful strategies that support meaningful learning is learners constructing models of what they are learning. " (p. xiv). The kinds of phenomena that can be modeled using different modeling tools are (a) domain knowledge, (b) systems, (c) problems, (d) experiences, and (e) thinking (Jonassen, 2000; 2006). Weblogs are well suited instruments for modeling experiences (i.e., for capturing, indexing, and making stories and experiences available for reflection on and enhancement of

by others). The next example which stems from the domain of teacher education explains why.

[INSERT FIGURE 2 ABOUT HERE]

Figure 1: Weblogs as instruments for reflection on action (http://www.reflectieblogs.info).

In the teacher training domain, a growing number of studies addresses the added value of weblog use for learning. These studies cover both weblog use in initial education (e.g., Granberg, 2010; Shoffner, 2009; Top, Yukselturk, & Inan, 2010) and subsequent professional development (e.g. Killeavy & Moloney, 2010; Luehmann, 2008). We present a project here where three groups of student teachers used weblogs for reflective practice during their apprenticeship – student-teaching - period (Wopereis, Sloep, & Poortman, 2010). Within each group, weblogs of student teachers and teacher trainers were connected to each other by means of hyperlinks and web syndication, creating a blog community. In order to promote ownership, customization features were offered to the students. Two other important features of each weblog were the possibility for students to protect each reflection contribution with a password and the option to categorize each post.

During the project, student teachers were asked to reflect on their actions in the classroom and provide feedback to fellow student teachers. In order to aid reflective storytelling, the student teachers were asked to post structured entries. These structured posts mirrored the phases of the ALACT-model for reflective practice of Korthagen (1999; Action; Looking back on the action; Awareness of essential aspects; Creating alternative methods of action; Trial).

By means of structured writing, student teachers were forced to better focus on learning specific teacher knowledge in a cyclic manner (see Mishra & Koehler, 2006) for an in-depth analysis of types of teacher knowledge). It was hypothesized that when student teachers record their reflections on action in a consistent and structured way, that this would result in deeper reflection and consequently to more and more meaningful conceptual change. The student teachers capitalized on the possibility to read the feedback on their posts as well as to read the other student teachers' weblogs (Boud, 1999). Seeing and thinking about multiple solutions for problems enriched the developing teaching knowledge base of the student teachers (cf. Lin, Hmelo, Kinzer, & Secules, 1999).

Dede (2009) classified weblogs as Web 2.0 applications for thinking. We see them as mindtools as well, provided the content is recorded in a well-structured way and that there is ample opportunity to interact with it. Multiple perspectives on the content, obtained by reading and discussing feedback, as well as the availability of experts may further help achieve conceptual change, the cornerstone of meaningful learning and a necessity for teachers in these quickly changing times.

Conclusion

Teacher education (i.e., pre-service teacher training and education) should not have as its goal the transmission of subject matter knowledge, pedagogical content knowledge and the current set of teaching tools to a new generation of teacher for the rest of their careers. The goal of in-service teacher education and training should not be simply the transmission of new knowledge either in the teacher's subject-matter domain or as "how to" training in the use of new technologies. The goal of both of these forms of teacher education should be, at the least, the gaining / acquisition of those competencies which allow

student teachers and in-service teachers to become and remain teachers who are reflective of the decisions that they make and who are able to interact with their ever changing environments in a meaningful and responsive way. This means that they need to become competent life long learners. Things are moving and changing too quickly, and life is becoming so complex, that courses cannot be made quickly enough and in great enough numbers to meet this need and teachers have neither the time nor the possibility to follow all of these courses.

Communities of Practice and weblogs can be the mindtools that can alleviate this problem. These are examples of good practice (we have presented two), but they are sparse and in the early stages of development and use. Teachers are still busy trying to obtain the necessary instrumental skills and schools still see information and communication technologies as productivity tools. The key is not initial education and continuing education at universities and teacher colleges. It is rather continuous (and ubiquitous) learning in communities of practice (including communities of interest and communities of expertise) and weblogs in and between schools, at teacher-training institutions, and in society in general. CoPs and blogs as mindtools can be the key needed to unlock a bright future.

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Atlantique 2011
Trois professeurs des écoles traversent l'Atlantique à la voile afin de sensibiliser les élèves au développement durable, aux énergies renouvelables et à la
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Evénement : 10 notions-clés pour enseigner les sciences de la maternelle à la 3e.
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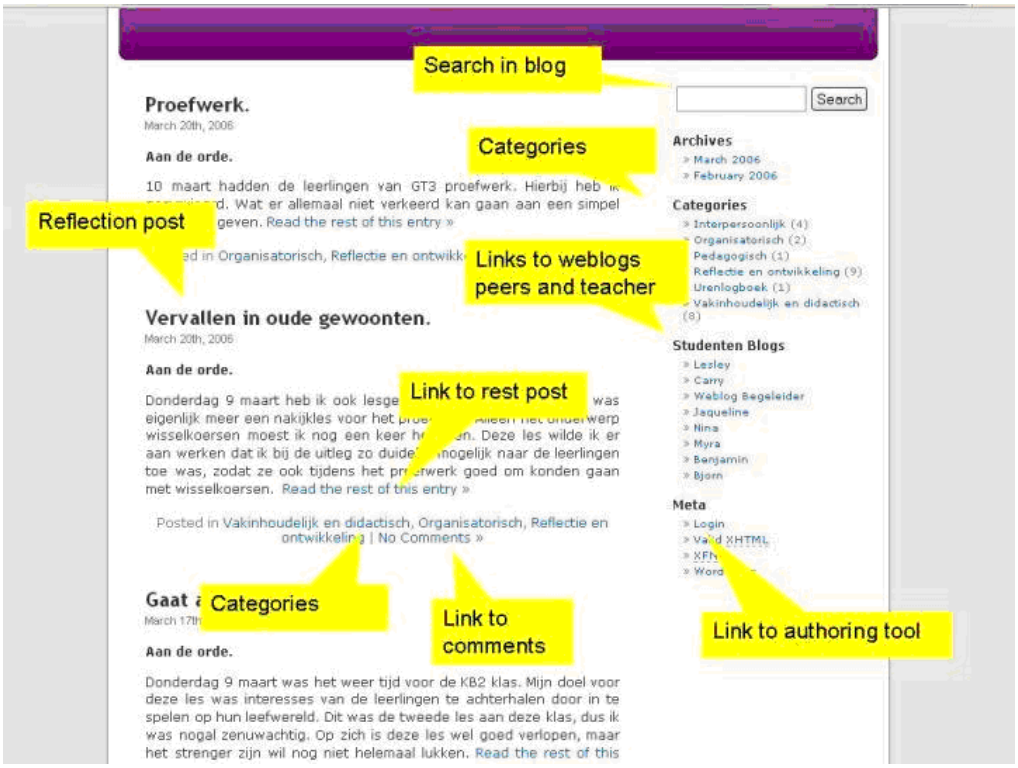
Figure 1


Search in blog
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Proefwerk.
March 20th, 2006
Aan de orde.
Categories
Archives
» March 2006
» February 2006
Categories
» Interpersoonlijk (4)
» Organisatorisch (2)
Pedagogisch (1)
Reflectie en ontwikkeling (9)
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» Vakinhoudelijk en didactisch (8)
Reflection post
Links to weblogs peers and teacher
Vervallen in oude gewoonten.
March 20th, 2006
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Link to rest post
Studenten Blogs
» Lesley
» Carry
» Weblog Begeleider
» Jaqueline
» Nina
» Myra
» Benjamin
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Figure 2