

## Networked Communities

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The Education for All 2015 target (UNESCO, 2000) is pushing teacher education and professional development to the forefront for developing and developed countries. Countries are developing policy statements that emphasize 21st century knowledge and skills (UNESCO, 1996). These skills include: technology knowledge and skills, higher-order thinking skills, problem solving, communication (reading, writing and multimedia), collaboration skills, and most importantly, working with knowledge (e.g., Senge, 2000). Teachers must adapt their teaching strategies to ensure that the education of all students prepares them to become knowledge workers or take on other complex roles in a technological world. They must ensure that students learn how to work collaboratively to improve their community. Teaching challenging content to learners of diverse backgrounds in a globalised world requires teachers who can create powerful learning situations using new tools, media, and virtual environments. Thus, there is an increasing worldwide focus on lifelong teacher learning, driven by the increasing impact of technology and an escalating pace of change in much of society.

The increasing access to Internet-based information and communication technologies holds great promise to not only refocus education but to help transform teacher preparation and the ongoing professional development of the existing teaching force. It also has the potential to transform existing educational institutions into learning organizations that are nodes in larger networks of teacher preparation institutions, schools, and professional associations. It may help foster a culture of learning that encourages knowledge sharing and collaboration among participants, developing and sustaining learning communities. The Internet's capabilities offer unprecedented opportunities for teacher educators and preservice and inservice teachers to engage in dialogue with each other and, in the process, create dynamic and evolving communities of practice that share expertise, ideas, and resources, to solve problems and co-create knowledge. The possible symbiosis between education reform and the emergence of networked communities is profound, and the promising possibilities of networked communities in education are increasingly capturing the attention of policy makers.

This chapter addresses the role of networked communities in enhancing and supporting teacher development and the ways that e-learning in informal and non-formal professional development communities may help meet the challenge of developing and improving teacher knowledge. The chapter examines current e-learning strategies and those that are emerging. The extent to which e-learning can be part of a national strategy for teacher preparation and lifelong teacher learning will vary according to access to computers and connectivity, whether content is constructed by participants

or delivered by professional development organizations, and costs.<sup>1</sup> These factors require careful consideration by decision makers.

A definition is helpful to begin to understand networked communities. In the broadest sense, a community is a group united by a shared sense of purpose, mutual concern, and a common interest. Networked communities of teacher educators and preservice and inservice teachers are an example of an online social network. Online social networks are webs of relationships that grow from computer-mediated discussions. The webs grow from conversations among people who share a common connection (e.g., teacher educators or teachers working in the same university, school, district, or discipline) and who differ in other ways (e.g., teachers in different locations, specializing in different disciplines or pedagogies).

There are many examples of networked communities involving teacher educators and teachers that demonstrate the power of online learning communities. They range from international networked communities that bring together teachers and classrooms to work on common projects, to small, informal groups of educators who enjoy conversation and collaborative problem solving with their peers. The Internet enables teachers to join learning circles and to create online projects with other teachers across the globe (iEARN, 2005<sup>2</sup>). It allows them to participate in live chat rooms and online discussion forums with other educators and to share lesson plans and learning resources (Teacher.Net, 2005<sup>3</sup>).

E-learning in non-formal and informal settings provides an opportunity for teachers to network, exchange experiences with colleagues, and collaborate to achieve common goals. Networked communities make possible new models for teachers' professional development—to do things differently or even to do entirely new things and demonstrate their value. For example, an initiative by the UK Department for Education and Employment focused on three subject areas in which there were teacher shortages (mathematics, Japanese, and Latin), and explored the use of online materials to support teachers' pedagogical development in one of these subjects (Fisher, 2003). The study focused on teachers' professional growth as they collaborated in a trial of online curriculum materials. The positive "side effects" of the teachers' involvement in the project included increased confidence, not only with the technologies but also with their own teaching strategies as they adapted the new curriculum to their own situations. Fisher also discussed how the situated use of materials led to sharing experiences with colleagues, increased participation in inservice activities and new working relationships. His analysis of this aspect of the project presents a view of how a networked community can act as a catalyst for professional growth and offer opportunities for teachers to generate knowledge. These findings echo those of Becker and Riel (2000) who found a positive correlation between professional engagement and the use of ICTs in their practice.

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<sup>1</sup> <http://www.un.org/Pubs/chronicle/2003/issue4/0403p45.asp>

<sup>2</sup> <http://www.earn.org/projects/index.html>

<sup>3</sup> <http://www.teachers.net>

In another example of the value of networked communities, Anderson and Kanuka (1997) evaluated the output, level of participation, and perceptions of effectiveness and value among participants in a virtual forum. Twenty-three experts in the field of adult education and community development were invited to participate in a three-week interactive session using a Web-based, asynchronous computer conferencing system. They concluded that the forum's goals to enhance the participants' knowledge of both the process of online consultation and their understanding of issues were achieved.

Another study by the Korean Multimedia Center indicated that teachers preferred the more flexible learning environment that e-learning provided and its interactions without barriers of time, space, or the need to be current. Their comment about traditional training was that such "...training programmes are delivered in a large classroom environment, with little interaction between instructors and teachers, or among teachers."<sup>4</sup>

Although e-learning is a powerful resource for teacher development, research indicates that a sense of community forms slowly online, and that face-to-face meetings can be helpful in overcoming a sense of isolation (Goldman, 2001). Face-to-face meetings can contribute to a sense of trust and community needed to engage in a critical examination of pre-existing assumptions. While traditional face-to-face workshops may lead to the development of a sense of community, they lack the ongoing interactions with colleagues provided by online communities. UNESCO<sup>5</sup> has noted two factors leading to successful Web-supported teacher communities: individuals who have an established history of sharing and working together before introducing computer-mediated communication tools, and providing some face-to-face meetings, especially at the beginning of a collaborative project.

## Contexts for Networked Communities

The emergence of the Web coincided with a growing awareness and recognition of new theories for learning (Scardamalia, 2003). Traditional approaches to teaching and learning are implicitly or explicitly based on the "knowledge transmission" model that has held a powerful hold on classrooms for decades (Cuban, 1993). Teachers transmit the facts and students are expected to remember them. Technology alone makes this model obsolete since there is so much information on the Web that makes teachers' knowledge only one source among many. Research from the learning sciences stresses that constructivist approaches to teaching and learning help students develop lifelong learning, flexibility, creativity, higher-order thinking skills, collaboration, distributed expertise, and technological literacy, all 21st century skills (Bransford, Brown & Cocking, 1999). The basic idea is that learners only understand what they have constructed. According to constructivist models, problem solving is at the heart of learning, thinking, and development. As learners solve problems and discover consequences by reflecting their experience, they construct their own understanding. Learning is an active process within the learner and is based on what the learner attends to, what activities the learner engages in,

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<sup>4</sup> KMEC <http://edunet.kmec.net>

<sup>5</sup> <http://www.unescobkk.org/education/ict/v2/info.asp?id=11009>

the connections the learner makes to prior knowledge, the consequences for the learner, and what the learner reflects on. The strength of constructivism as a theory of learning lies in its description of learning as a process of personal understanding and meaning making which is active and interpretative.

Along with the importance of teaching and learning approaches that take constructivism seriously, research shows that knowledge construction is rarely done in isolation. People in a field work together building on the ideas and practices of the group. Collaborative learning has been shown to enhance student learning in higher education (McKeachie, 1994), and in elementary classrooms (Brown and Campione, 1990). This is socio-constructivism.

Beyond socio-constructivism is an approach in which individuals and groups aim at improving ideas: a knowledge building community. A knowledge building community requires participants who are committed to sharing and advancing ideas and knowledge for their community (Scardamalia, 2000). In many respects, knowledge building communities are similar to research communities in which members share responsibility for creating new knowledge that may potentially be shared with other research communities. Participants set out their theories and ideas from various viewpoints; they consider how well diverse theories account for information or whether one theory provides a better account than another, And so, through discourse, they progressively improve their understanding. In these kinds of communities, there is a culture of expertise in which individuals intentionally pursue deeper levels of understanding, and individual understanding is driven forward by the need to collaboratively advance the group's knowledge. In this way, the community produces cultural artifacts, theories, and explanations of value for themselves and others (Bereiter, 2002). Knowledge building communities are effective in elementary schools (Hewitt, 2004), in secondary schools (Chan, Van Aalst & Lee, 2003)), in preservice education (Lamon, Reeve & Caswell, 1999), and in teacher professional development (Ahlberg, 2001).

Although research has shown that socio-constructivist and knowledge building approaches lead to learning with deep understanding, neither are generally accepted practices in schools. The reasons are many—a reliance on delivery of information, schools that focus on students repeating what has already been learned, teachers' needs to be in control of the knowledge, and a lack of awareness or mistrust of educational research. Elmore (1996) has noted that school cultures often prevent the spread of innovation because schools are not organized to support problem solving based on collaboration. The stronger culture in schools is teachers practicing as individuals with individual styles. Using new technologies to support transmission models of teaching will not increase student achievement as much as those emphasizing socio-constructivism. Policy makers, along with teachers, need to select professional development providers not only on the basis of their technology skills but their underlying models of teaching and learning.

Both learning sciences research and experience in the workplace as a whole (St-Onge, 2003) show that online communities are important for learning. Networked communities are advocated for formal, non-formal, and informal teacher education. The power of networked communities is that they can

support the formal, non-formal, and informal aspects of teacher education. As Table 8.1 shows, formal education is organized as a systematic educational activity, led by a teacher educator and carried on within the framework of a university or normal school that results in teacher accreditation. Non-formal education is also organized, but by professional associations, schools, or school districts to provide selected types of learning without a systematic accreditation process. Informal learning may be organized within a school, district, or professional association, but is primarily based on teachers' interests in joining a community of like-minded peers. Non-formal and informal learning are usually not formally recognized and this poses a challenge for teachers as well as for decision makers. There is a limit to teachers' commitment. How will the effects of professional development in informal and non-formal environments be monitored and recognized? A possible solution is to combine assessments from formal, non-formal, and informal educational settings with those that are generated by online systems and the learner's own assessment.

**Table 8.1: Characteristics of formal, non-formal, and informal education**

Characteristics	Formal	Non-formal	Informal
Organization	Universities/normal schools	School/District based/ Professional Associations	School/District based/ Professional Associations interest based
Goal	Accreditation	Learning specific content or strategies	Becoming a member of a community of practice
Content	Mainly structured curricula	Negotiated	Constructed meaning based on dialogue
Structure	Course/programme completion	Completion of the specified goal	Sustained participation as a manifestation of interest
Access	Local and national standards	Curricular and pedagogical resources	Teaching communities and their shared repertoire of resources
Knowledge	Declarative Knowledge - knowing that	Knowing that and knowing how	Tacit Knowledge - knowing how

Leadership	Course instructor	Moderator probably pre-ordained	Distributed moderation depending on expertise
Timeline	Course/ programme	Limited	Potentially ongoing
Community	Class/course	Learning community	Community of practice

In the following paragraphs, two types of networked communities are considered. Learning communities are groups of people who work together intensively for a specified period of time to achieve a product, such as a new understanding of a problem or a task completed in a collaborative way (Riel and Polin, 2004). Communities of practice are groups of those who are engaged in the same occupation or career (Lave and Wenger, 1991; Kirschner and Wopereis, 2003). Communities of practice are usually informal while learning communities are typically non-formal. Each has strengths and weaknesses. Other differences between the two will be highlighted using four dimensions: membership, goals, participation structures, and growth mechanisms (Riel and Polin, 2004).

### Learning communities

Professional development must help teacher educators and teachers learn to teach, sometimes in new ways, and to reflect on their own learning processes and the implications for their own instructional practices. If current theory is to reach the classroom, teachers must have more than awareness of current ideas; they must be able to apply their understanding in their classrooms. The explicit goal for learning communities is to assemble a group of people focused on common issues or problems, and then, through discourse and common work, find solutions to problems, complete tasks, or refine processes beyond the capabilities of any single person. These learning communities may be structured within professional development courses offered by institutions of higher learning, but are more often non-formal communities relying on participants' goals.

Wideworld<sup>6</sup>, an online learning community based at Harvard, offers courses and forums for teachers and administrators on teaching for understanding. Teaching for understanding is concerned with practices that integrate performances into learning and assessment in the context of generative curriculum content (Perkins & Blythe, 1994). Learning Times<sup>7</sup> at Columbia offers webcasts, ongoing asynchronous discussions on curriculum development, and online meetings to plan lesson strategies. Derry's eSTEPWEB<sup>8</sup> is an integrated network of online tools and materials designed

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<sup>6</sup> <http://learnweb.harvard.edu/ent/welcome/index.cfm>

<sup>7</sup> <http://www.learningtimes.net/columbia.shtml>

<sup>8</sup> <http://www.estepweb.org>

by university researchers to support advanced learning for secondary teachers.

For schools and school districts, professional learning communities are promoted for teacher and school development not only in the United States (Dufour, 2004); but also in Canada (Fullan, 1993) and the United Kingdom.<sup>9</sup> Like teacher networks (Lieberman, 2000), they are often referred to as instruments of educational reform. For example, the National Educational Service<sup>10</sup> in the USA offers a self-paced, self-directed online course for teachers within a school. The course provides a set of activities that allows teachers and school administrators to practice professional learning community concepts by examining a fictitious school. The goal is to understand the concepts and processes involved in professional learning communities through examples and suggested actions that schools could take to become a professional learning community.

Exemplar online networks involving students and teachers with a global reach are:

\* UNICEF<sup>11</sup>, which offers a worldwide opportunity for teachers and students to participate in discussions on current global issues. In each project, information and communications technology encourages new relationships between teachers and students and provides new ways of learning through visualizations, simulations, and multimedia.

\* I\*Earn<sup>12</sup> is the world's largest non-profit global network and enables students and teachers to use the Internet and other technologies to engage in collaborative educational projects.

\* Webquests<sup>13</sup> are inquiry-oriented activities in which some or all of the information used by learners is drawn from the Web. Webquests are designed to use learners' time well, focus on using information rather than looking for it, and support learners' thinking at the levels of analysis, synthesis, and evaluation.

These networked communities are structured for a definite time period to reach a clearly identified goal, completing a project such as a Webquest challenge, or a process for collaboration (Collins and Bielaczyc, 1999). The goal is important. If the goal is to produce a product, a presentation, or a demonstration, the produced artifact is likely to remain static. Others may use it, but there isn't a built-in mechanism for that product/process to further develop. However, having students and their teachers focused together on an investigation allows them to learn from each other as they complete the project and promotes a more democratic classroom that can extend beyond the boundaries of a specific project. Like communities of practice, but unlike most formal inservice courses, learning communities

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<sup>9</sup> UK, National Center for School Leadership: <http://www.ncsl.org.uk/>

<sup>10</sup> <http://www.nesonline.com/Catalog/ItemDetail.asp?Product=270>

<sup>11</sup> <http://www.unicef.org/voy/>

<sup>12</sup> <http://www.iearn.org>

<sup>13</sup> <http://webquest.sdsu.edu/>

occurring in informal or non-formal/formal (course-based<sup>14</sup>) contexts aim for communication that is more open, with opportunities for collaboration. Learning communities, if they are successful, can become communities of practice. Relationships, shared problems, and tentative solutions may encourage participants to continue even after the original goals of the learning community have been achieved. For example, the United States' National Writing Project's online community of teachers and librarians share tools, resources, and strategies for furthering their mission to improve students' engagement in writing.<sup>15</sup> Virtual learning communities can be an excellent beginning for online professional development.

Most networked communities are the result of participants coming together because they share the same virtual space and have similar problems—a totally online learning community. Riel and Polin (2004) have wondered why these groups form communities when the communities exist for a short period. One reason has been the efforts of moderators or mentors.

### *Moderator, mentors and communities*

The creation of learning communities may arise around a particular need, issue, or project of teacher educators, their students, or a group of teachers. Successful communities go through three distinct phases that must be addressed (Ponti, 2004). These are:

- Initiating the activity;
- Fostering group self-management; and
- Sustaining the activity.

To facilitate the phases requires leadership within the group, usually in the form of a moderator. The role of the moderator is to help set up goals and to foster and maintain a supportive learning climate within the community. The moderator helps focus the discussions, coordinates tasks, and makes sense of individual actions that go toward development of a common product. In addition, the moderator monitors the quality of conversations and progress toward the group's goals. Effective facilitation entails reading most postings and intervening occasionally to provide strategic guidance for the direction and tone of the conversation. Cerratto and Wærn (2000) found that moderated groups in a Tapped In<sup>16</sup> synchronous environment were more focused on tasks, but unmoderated groups were more concerned with social issues. In short, facilitators help participants develop norms for their online interaction and become critical inquirers into their own and their peers' content understanding and learning processes. The Virtual High School, part of the Concord Consortium in the USA, has published a book on

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<sup>14</sup> Some online instructors create learning communities with their geographically-distributed students, and are considered course-based and belong to the chapter on online learning.

<sup>15</sup> <http://www.writingproject.org/Interactive/>

<sup>16</sup> <http://www.tappedin.com>



online facilitation (Collison, Elbaum, Haavind and Tinker, 2000). Learning networks have also been created to deal with online facilitation<sup>17</sup>.

Online technology also supports a learning community's evolution by building its capacity for informal professional development through mentoring and coaching (Schlager and Fusco, 2004). Online mentoring can be an important support system for teachers during their induction years. This mentoring may be in the form of "just in time" online group discussions, one-to-one telementoring, and access to Web-based resources especially selected for novice teachers (Harris, 2004). Online mentoring and coaching may also bring teacher educators, teachers, students, and experts together to focus on specific learning goals and outcomes. In Canada, O'Neill and colleagues collaborate with teachers, students, historians, and history telementors to understand how development of the railways affected Canada's history (O'Neill, Sohbat, Martin, Asgari, Lort, and Sha, 2003).

It should be noted that moderators and telementors are experts, and teachers may be learners. A study by Kuure, Saarenkunnas, and Taalas in Finland<sup>18</sup> provides some interesting evidence on how these roles could be a problem. They speculated that in online environments, the roles of teachers and learners should be flexible to facilitate movement from legitimate peripheral participation to full participation, as in communities of practice (see Lave and Wenger, 1991). However, they found that online mentors adopted either a strategic mentoring role or a collegial mentoring role. The former tended to set up collaboration obstacles while the latter tended to be more successful. Developing successful networked communities is not a matter of developing particular kinds of designs for learning environments, new task types, or interaction patterns alone. What is important is that at least some participants will be able to assess the collaborative processes of learning and the complexity of meaning-making in e-learning and make contributions that move the community forward. Otherwise, the networked community remains moderator-centered and does not evolve. Facilitation, to be effective, must eventually be taken over by the participants themselves. When teachers can engage in inquiry collaboratively with little involvement of outside moderators, life-long learning will become far more ubiquitous.

## Communities of practice

The term community of practice (Lave and Wenger 1991) describes the institutional and interpersonal activities that unite groups who are engaged in the same occupation or career. These groups share a concern or a passion for something that they do and they interact regularly to learn how to do it better. Wenger notes: "A community of practice is not merely a community of interest of people who like certain kinds of music, for instance. Members of a community of practice are practitioners who develop a shared repertoire of resources, experiences, stories, tools, ways of addressing recurring

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<sup>17</sup> For example, The Global Educators' Network (<http://vu.cs.sfu.ca/GEN/welcome/welcome.html>); and the website emoderators is also a resource (<http://www.emoderators.com>)

<sup>18</sup> Applied Language Studies Webjournal: (<http://www.solki.jyu.fi/apples/>)

problems-in short a shared practice. This takes time and sustained interaction.”<sup>19</sup>

The idea of apprenticeship is important in understanding membership in a community of practice. New teachers enter as peripheral participants who learn from more experienced teachers and gradually move into central positions in the community to mentor newer teachers. Thus, leadership is distributed according to expertise/experience. The goal for communities of practice is not to build dynamic knowledge systems for future generations; instead it is to experiment with tasks, tools, processes, and roles, and to refine procedures or develop new tools for current practice. Well functioning communities of practice do advance practice in established domains, but this is less clear when it comes to new domains, practices, and entirely online communities of practice.

Although we are beginning to understand existing communities of practice, we understand little about the conditions under which online communities of practice are formed and sustained (Schwen & Hara, 2003). Tsui and Wah (2002), in their study of dimensions that mediated Hong Kong teacher participation in computer conferencing, concluded that "there are technical, social as well as psychological dimensions that must be attended to by those who are trying to build electronic communities of this nature" (p. 39); they suggested that technical accessibility of the network is important and that teachers must have a very safe environment in which they feel free to express their thoughts and ideas and ask questions. It is important that teachers share the vision of building a professional community on the network and see themselves as having a role to play in the realization of this vision (p. 40).

Teachers in small remote schools in Quebec have found collegiality and professional support through synchronous and asynchronous participation in a Canadian Ministry of Education initiative to compensate for the demographic changes of fewer people living and working in remote rural communities. The initiative encourages local development and innovation through networking and connects educators to universities for professional development (Laferrrière, Breuleux, and Inchauspé, 2004).

The Digital Education Enhancement Project (DEEP) funded by the Education Department of the UK, focuses on the use of information and communication technologies for teaching and learning in a range of primary schools in Egypt and South Africa. "A shared electronic conference and Web environment has been developed that links educators to each other and is also being evaluated by project participants." E-learning is used within the DEEP project to support teachers' construction and understanding of new professional knowledge by experiencing new situations, practices, and people and as a metacognitive tool, enabling reflection on the learning process both at individual and group levels (e.g. conferencing and joint products such as electronic self-assessment). After studying this project, Leach, Moon, and Power (2002) pointed to the enormous potential of information and communications technologies to transform the models and processes of teacher development and learning, as well as providing professional support.

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<sup>19</sup> [http://www.ewenger.com/theory/communities\\_of\\_practice\\_intro.htm](http://www.ewenger.com/theory/communities_of_practice_intro.htm)

Three other communities of practice are “Tapped In” in the USA, La Main à la pâte in France, and an international Learn-nett project. The Tapped In online community testbed project (Schlager & Fusco, 2004) develops and studies the online social and technological infrastructures needed to support a large and diverse community of education professionals. La Main à la pâte<sup>20</sup> is a community of practice for science teachers throughout France, promoting innovation in the teaching of elementary science by encouraging teachers to implement practices by which students can experiment, observe, query, and reason. Learn-nett<sup>21</sup>, an international collaborative partnership of teachers, students, and researchers, provides a Web site and ICT tools for non-formal and informal teacher education. To share knowledge and create online communities of practice is now seen as a new outcome in and of itself.

Not all communities of practices develop strong community structures (Riel and Polin, 2004). The idea of communities of practice is derived from naturalistic work settings in which newcomers are invited into the community to develop the kinds of skills demonstrated by experts. However, online communities of practice for e-learning have a looser membership structure, perhaps interfering with the formation of a stable core; and it is well known that effective communities of practice must have a stable core. Tapped In designers are concerned "that, as in many professional development projects (online and face-to-face), teachers' experiences in Tapped In will remain only tangentially related to the predominant practices of professional development in their own school districts. In our eyes, that would constitute failure of our mission-helping teachers to break out of their isolation only to grow apart from their local practice professionally is not our intent." (Schlager & Fusco, 2003, p. 204).

Wikis may be used to support communities of practice. A wiki is a hypertext system for storing and modifying information and is a freely expandable collection of interlinked web pages. Any user can easily edit each page with a forms-capable Web browser. Wikis exhibit some of the elements that Wenger (2001) considers fundamental to the creation of successful communities of practice. These include a variety of interactions, easy participation, valuable content, connections to a broader subject field, community identity, and interaction and evolution over time. Wikis may be used to support knowledge creation by a community of practice and of the sharing and co-constructing of knowledge and resources. An example of a Wiki is Wikipedia,<sup>22</sup> the free-content encyclopedia that anyone can edit. Thus, educational communities of practice may be used to develop high quality culturally responsive learning resources and content to address important educational needs.

In summary, communities of practice can go beyond improvement of current practice to a more theoretical orientation by becoming learning communities focused on a central educational problem, such as MirandaNet's “Web-wise Wapping project,” in which a community of teachers, parents, and students work collaboratively to learn to use ICTs

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<sup>20</sup> [http://www.icsu.org/8\\_teachscience/icsuiap/teachingscience/](http://www.icsu.org/8_teachscience/icsuiap/teachingscience/)

<sup>21</sup> <http://tecfa.unige.ch/proj/learnett/>

<sup>22</sup> [http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page)

wisely and efficiently.<sup>23</sup> Table 8.2 summarizes the advantages and limitations for learning communities and communities of practice.

**Table 8.2: Comparison of Communities of Practice and Learning Communities**

	Communities of Practice		Learning Communities	
Factors	Advantages	Limitations	Advantages	Limitations
<b>Membership</b>	Apprenticeship	Hierarchy	Intentional	Event bound
<b>Goals</b>	Improve practice	Reproduce effective practices	Well specified	Limited evolution
<b>Structure</b>	Access to peers	Shared group identity	Diversity of perspectives	Temporary group identity
<b>Growth</b>	Through new members	Community isolation	Transfer through products	Ends with task completion

### An emerging trend: Knowledge building communities

A knowledge building community represents a group of individuals or organizations that work together to advance knowledge in their field. The Knowledge Society Network<sup>24</sup> (KSN) is an example of a knowledge building community in education. It is a collaborative effort to bridge the gap between teachers and researchers and bring together organizations undergoing change in both the nature and expectations of knowledge work because of the new information and communication technologies. This is an international virtual organization of teachers, students, teacher educators, cognitive and computer scientists, educational administrators, and workers in health and community organizations in about 30 countries. Local communities are involved in sustained collaborative creative work and come together through virtual meetings and a shared database to help other communities advance their understanding of building knowledge collaboratively. Multiple perspectives greatly enhance reflective analyses and lead teachers to reconsider their assumptions about students, learning processes, content, assessment, and their roles in the classroom. Making assumptions explicit is a first step toward reexamining them. If learning communities or communities of practice adopt the goal of advancing the profession of teaching, they become knowledge-building communities.

In developed and developing countries one of the most powerful aspects of knowledge-building communities is the collective ability to build knowledge that is of benefit to all. In countries that have limited high quality, culturally appropriate learning resources, knowledge-building communities of

<sup>23</sup> [http://www.mirandanet.ac.uk/wapping/web\\_wise\\_wapping.htm](http://www.mirandanet.ac.uk/wapping/web_wise_wapping.htm)

<sup>24</sup> The Knowledge Society Network: <http://ikit.org>

educators and subject matter experts could work together to create the needed learning resources.

Senior management will need to address important questions about whether the innovation is better than what it replaces. What risk is involved? How can capacity building be fostered? Is it worth the change? Since teachers must be well trained to successfully use technology to enhance learning, what should education policy makers do to support and encourage appropriate strategies for professional development? No single approach to professional development will meet the learning needs of all teachers seeking to develop skills and knowledge in the integration and application of technology. Networked communities will increasingly demand collegiality, experimentation, risk-taking, and informed discourse, reflection, and collaboration.

### What Can Policymakers Do?

What policies will foster the development and use of networked communities in teacher development?

*Local and Dispersed Communities.* E-learning provides promising opportunities for collaborative learning environments to extend the reach of interactions beyond the geographical limitations of traditional communities. It can expand the possibilities for new kinds of communities based on shared practice. Professional development should work to develop networked communities by establishing social connections among teachers and technical staff, and administrators so that they can support each other through informal interactions about technology issues, and later pedagogical issues. When teacher participation in such communities is grounded in local contexts of practice and professional development, the learning experience provides realness and flexibility and is likely to increase in the long term.

*Time and Reflection.* Teachers need time to reflect upon what they have learned, to integrate new knowledge into practice, to reflect upon the outcomes of changes in their practice, and to make further adjustments as needed (Schon, 1983). Networked communities can help foster reflection through the use of Web logs called "blogs." The weblog is an easy to use tool to help novice and experienced teacher to reflect on their teaching practices. Weblogs are a personal writing space that is easy to use, share, and automatically archive. They are easily linked and cross-linked to form learning communities. They enable teacher educators to evaluate preservice teachers' thinking, concerns, or problems and can be incorporated into digital portfolios of preservice teachers' work. The accumulated weblogs can become a content management system and the experiences and stories shared by teachers and teacher educators can play a role in professional development.

It is also important for the more formal professional development programmes to provide time and follow-up for teachers to master and integrate new content and classroom strategies (Corcoran (1995). The online community can help support the professional development programme, enabling teachers to continue to dialogue with teacher educators and peers as they implement the concepts, strategies, and ideas provided in the programme. Time devoted to a community of practice aligned with an organization's goals is well spent.

*Incorporating Networked Communities as an Integral Part of the School Technology Plan.*<sup>25</sup> Networked communities and professional development should be an integral part of the school technology plan or overall school improvement plan, not just an add-on. Initial inclusion in the technology plan ensures that professional development and ongoing online communication and support of teachers are considered an essential factor in using technology to improve teaching and learning. Professional development is most effective when technology is linked with broader reform goals of school or district improvement.

*The Research-Practice Divide.* Bereiter (2002) has argued that there is a systematic failure in implementing new possibilities in education including effective use of new technologies. Professional development in networked communities should contain all the components that research has found to be most essential. Partnerships with universities and professional associations can provide a solid social infrastructure for engaging teachers in networked communities that connect to a body of information about effective practices, and will bring relevance to their classroom practice.

What policies will sustain support for teachers to participate in networked communities?

*Sustained Support for Teachers' Use of the Internet.* It is very important for teachers to acquire knowledge and skills using Internet-based technologies. But once teachers begin to acquire such skills and use the Internet, they need support to continue using these new tools. The initial training of teachers is not likely to guarantee that the technology infrastructure will continue to be used. One of the most important aspects of support is a thorough, systematic approach, based on a clear policy. A well-elaborated national policy is a prerequisite for countries to compete in the new global economy and knowledge-based society.<sup>26</sup>

*Technology Infrastructure.* Sustained support of teachers' use of the Internet and related tools should include policies to maintain the structure and operation of the technology system itself, so that teachers can rely on the system as a dependable instructional device for the classroom. Policies at the district or national level are needed to support ongoing connectivity charges, so that teachers can regularly use Internet resources.

*Collaborative Planning.* The National Staff Development Council in the USA suggests that professional development activities associated with technology often produce anxiety in teachers who worry about the disparity in skills and knowledge between themselves and colleagues. However, when teachers are involved in the development of programmes it diminishes their anxiety and ensures that their own personal learning needs will be met. Over time, basic learning programmes evolve to offer opportunities for collaborative learning within a networked community. Collaborative teaching could be the next step in planning and implementing network-based activities for students.

*Policy Stability.* Kozma,<sup>27</sup> who has studied education in South America, says that Chile's ability to maintain a national effort that relies on the

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<sup>25</sup> <http://www.ncrel.org/sdrs/areas/issues/methods/technlgy/te1000.htm>

<sup>26</sup> <http://www.unescobkk.org/education/ict/v2/info.asp?id=11009>

<sup>27</sup> <http://counts.edweek.org/sreports/>

government's partnerships with universities and business can be a powerful model for countries in which governments recognize the crucial link between education and economic development. On the other hand, Hawkins<sup>28</sup> notes that countries such as Peru and Paraguay have not made as much headway with educational technology because of government turnover.

*Innovation Sustainability and Scalability.* If networked communities are to continue exist and expand, they must become an integral part of education systems and receive support and recognition. This is a critical step in order for non-formal and informal networked communities to be included in lifelong teacher learning strategies in all countries.

### How will teacher participation in networked communities be evaluated?

High-quality professional development contributes to the development of a collegial and collaborative culture. In the USA, the National Foundation for the Improvement of Education suggests that effective professional development is characterized by the development of school-based professional learning communities in which staff work toward commonly held goals, colleagues exchange ideas and knowledge and provide constructive feedback and encouragement among one another, and innovations are publicly acknowledged. Members of school-based professional learning communities may also find learning opportunities highly relevant to their work within specific networked communities. Will these school-based professional learning communities encourage members to participate in networked communities? Will the participation of innovative teachers in networked communities be supported? Will teachers isolated in small rural schools be encouraged to join networked communities? There is clearly a need, and a possibility, for networked communities to exist and develop. But for participation in a networked community to be supported and recognized as legitimate professional development, evaluation is necessary.

*Evaluation of Professional Development Providers.* Effective professional development includes evaluation to ensure that each activity meets the learning needs of participants. The North Central Regional Educational Laboratory (2000) describes three types of evaluation that should be built into every professional-development programme: performative evaluation (e.g., based on classroom videos), formative evaluation (e.g., based on assessments designed for teacher feedback), and summative evaluation (e.g., based on student outcomes). A variety of methods of data collection should be employed and multiple sources of information consulted. Collectively, these three forms of evaluation contribute to the ongoing assessment of a professional-development programme, providing data to inform adjustments to ensure that the programme is meeting its objectives.

*Professional Development Requirements.* Policies that either mandate or provide opportunities for participation in networked communities cost money, but without the establishment of policy that mandates or provides this form of e-learning, teachers are unlikely to acquire the skills they need to use the technologies effectively with their students, thus negating the potential

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<sup>28</sup> <http://lnweb18.worldbank.org/External/lac/lac.nsf/>

benefits of the investment made in infrastructure. Teachers might want to be paid or given other incentives to engage in non-formal or informal networked communities. Policy makers may wish to evaluate teacher participation. Moderator or peer evaluation might be appropriate. Research on participation assessment (qualitative analysis of social or cognitive presence, progressive online discourse, or latent semantic analysis) in networked communities is progressing but is still in its early stages. Performance-based assessment is the alternative.

*Evaluation of Strategies.* Lemke<sup>29</sup> suggests a self-assessment tool for schools, districts, and states to assess their progress in bringing technology and telecommunications into their systems to improve student learning and an accountability system for decision makers to track the return on public investments in education technology. Technology is considered as a lever for innovative teaching and the attainment of 21st Century skills.

*Evaluating Teacher Use of E-learning.* A critical issue for education policy makers is the extent to which teachers' effective use of technology is or should be a criterion in evaluating their performance. This is a complicated issue. To encourage use of e-learning as a way to provide high quality professional development it may be necessary to create policies that recognize quality performance with Web-based technologies, but this may reflect negatively on those who do not use the technologies.

This general issue is complex in part because of divided opinion on how important technology use is to the future well being of citizens in a district, or in a nation as a whole. There are many writers who make the argument that individuals, much less nations, cannot hope to survive or prosper unless they are very familiar with Internet-based technologies. Others dispute this claim (Cuban, 2001). Given this deeply rooted controversy, establishing policies about how teacher performance will be judged is of critical importance. Policies that reward teacher educators who use and model the use of e-learning technologies to enhance learning are making a statement about what is valued in the educational system or society at large. And this kind of policy will dramatically affect how teachers are prepared and what is taught in classrooms, and how. However, teachers who participate in networked communities may be learning subject matter or pedagogical practices online, but may not be able to integrate Internet-based activities in their classrooms if they don't have the needed equipment, connectivity, or support. The evaluation question thus becomes larger than the immediate issue of judging the performance of an individual teacher educator or teacher. Rather, it reflects available resources and fundamental values about what education should be for a community.

These are but a few of the issues policy makers must address as they commit to building and supporting networked communities to enhance teacher development. Teacher educators and teachers central are not only to the effectiveness of e-learning in education, but also to the emergence of knowledge societies. How teachers acquire the skills they need to use new technologies and e-learning, and how the technology is actually used and to what ends, are critical policy domains that must be carefully explored. It is

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<sup>29</sup> [http://www.mff.org/edtech/article.taf?\\_function=detail&Content\\_uid1=97](http://www.mff.org/edtech/article.taf?_function=detail&Content_uid1=97)



hoped that issues of this nature will be considered as decisions are made about networked communities for teacher professional development, and as educators make decisions about the future directions of teacher education and the professional development of the existing teaching force.

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