CILT2000: Community Tools

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Community tools are technologies designed to foster social processes of learning through active inquiry, project-based learning, and related collaborative pedagogical approaches. Current research and development in this field are moving from generic tool design towards the development of sociotechnical systems that address learning in relation to specific domains of knowledge or activity and social issues such as equitable access to learning opportunities.

KEY WORDS: technology; education; equity; community tools; social learning; collaborative learning; sociotechnical systems.

Despite extraordinary growth of interest in “virtual universities,” the “virtual classroom,” and “distance education,” there is still a remarkable shortage of supports for on-line collaborative learning processes. Current efforts too often rely on teacher-centered, lecture-at-a-distance approaches, and a traditional information-transfer model of learning. In contrast, recent research in the social and cognitive sciences highlights the ways in which project-based, active inquiries allow learners to collaborate to construct meaning with local and distant peers, mentors, and guides (Bransford et al., 2000). Community tools are technologies that foster these kinds of social processes of learning.

The Community Tools workshop at the CILT2000 conference attracted more than 80 leading researchers and industry developers interested in forming collaborative relationships to advance their work in this field. In previous years, the interests of our workshop attendees have clustered around topics such as collaborative representations, sociocognitive scaffolding, and tools to foster self-improving communities (Roschelle and Pea, 1999). Collaborative representations such as Belvedere (http://lilt.ics.hawaii.edu/lilt/software/belvedere/overview.html) are technologies that support learning interactions mediated by visualizations, notations, and models. Research has shown that collaborative representations are a critical enabling technology for successful learning conversations about complex subject matter in mathematics and science (Roschelle et al., 2000; Suthers, 1999). Sociocognitive scaffolds employ pedagogical principles to structure learning around activities such as posing questions, seeking diverse viewpoints, creating arguments, and reflective analysis and revisions based on critique. Tools that illustrate these principles include the Knowledge Forum (http://www.knowledgeforum.com/), the Learning through Collaborative Visualization project (http://www.covis.nwu.edu/), and the Web-based Inquiry Science Environment (WISE) (http://wise.berkeley.edu/). Network improvement tools, such as multiuser virtual environments, foster new kinds of social and knowledge networking and have the potential to enhance learning by linking individuals to new sources of knowledge, like-minded peers, subject-matter experts, or teachers. Key examples in this category include environments designed to foster teacher professional development (http://www.tappedin.org) and children’s constructivist learning (http://www.cc.gatech.edu/elc/moose-crossing/).

As tools for learning communities have gained a wider range of users and more advanced functionality, researchers and developers are shifting their focus along two main dimensions. First, they are looking beyond tool design per se, to consider in more sophisticated ways the patterns of tool use in social contexts. From this perspective, learning technologies are designed, described, and analyzed...
as components of sociotechnical systems, and societal issues such as equity of on-line learning opportunities are highlighted. Second, our workshop participants are moving away from generic tool design to sharpen their focus on specific applications, such as teacher professional development, and academic subject areas like math, chemistry, social studies, and literacy. In these projects, researchers and developers are likely to consider first particular social or pedagogical needs, and from that vantage point examine the design and use of technological tools for learning communities.

The focus on tools in social context was evident in research reported at our workshop examining the relationship between technical functionality and the social, psychological, and cultural aspects of community and learning. Examples include an investigation of how educators collaborate on-line to develop both technology and pedagogy to support classrooms as interconnected learning communities (http://www.telelearning-pds.org), experimental studies of the social–psychological aspects of trust development of computer-mediated communications (http://kn.cilt.org/cilt2000/abstracts/2070.html), and a well-tested approach to fostering constructivist learning through on-line dialogue (http://ccservices.concord.org/moom/brochure4.html).

While equitable access to technology and related educational opportunities have not traditionally been a central focus of research on learning technologies, recent societal concerns over a growing “digital divide” have spawned new interest in this topic. In an effort to stimulate research on equity and learning technologies, CILT2000 conference organizers emphasized this theme across all conference activities and stipulated that workshop presentations and follow-up seed grant proposals address equity issues. While the degree to which participants dealt with equity varied, several participants addressed it substantively. Examples from the Community Tools theme include a design study of inclusiveness during problem-based learning activities (http://kn.cilt.org/cilt2000/abstracts/2121.html), the use of on-line discussion to encourage equitable participation within a classroom (http://kn.cilt.org/cilt2000/abstracts/2091.html), and a cross-cultural project designed to foster participation by students in the United States and Japan through the use of multiple representations, mentors, and personalized learning (http://riversproject.org). We see this as a significant if small step toward the integration of social issues and technological design.

While participants demonstrated increased attention to the social context of technology use, they also evinced greater focus on specific subject matter. By far the strongest trend in this direction is the development of community tools for teacher professional development. Examples include a well-established multiuser virtual environment where teachers can meet in real time (http://www.tappedin.org), a project to foster the scholarship of teaching and learning through on-line collaboration technologies and multimedia (http://www.carnegiefoundation.org/KML/), and two projects that use classroom video as an anchor for on-line collegial discussion among practicing teachers: Seeing Math (http://www.concord.org/seeing_math/) and the Inquiry Learning Forum (http://ilf.crlt.indiana.edu). Domain-specific efforts include projects in social studies that incorporate cross-cultural student communication with on-line peers (http://quest.classroom.com), socio-cognitive scaffolds for understanding chemistry (http://chemsense.org), and literacy software for young children based on e-mail exchanges (http://www.kidcode.com).

To further extend collaborative work begun at CILT2000, the Community Tools theme provided funding to four seed grant projects (see proposals: http://cilt.org/seedgrant/seedct00.html). The PlaySpace project examines learning in multicultural, digital, playful environments through a review of related literature and products, and a summary of lessons learned. In the Equity project, researchers investigate how the design of on-line learning environments can be used to promote educational equity. The Media Rich Annotations for Learning project brings together a diverse group of scholars to implement and analyze the same digital annotation tool in eight different educational settings, including museum exhibits and teacher professional development activities. Finally, the Early Career Research Group fosters the professional development of pretenure scholars in learning technology through an informational public web site, contributions to the CILT Knowledge Network (http://kn.cilt.org), and plans for open meetings at three related national conferences (International Conference of the Learning Sciences, Computer Support for Collaborative Learning, and the American Educational Research Association).

The trends toward broader social contextualization of tool design and highly tuned domain-specific