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# THE FUTURE OF E-LEARNING COMMUNITIES

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AMY BRUCKMAN

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**W**HAT IS THE POTENTIAL OF THE INTERNET TO SUPPORT LEARNING? TO BEGIN TO ANSWER THE QUESTION, WE MIGHT FIRST EXPLORE AN OLDER TECHNOLOGY: WHAT IS THE POTENTIAL OF BOOKS TO SUPPORT LEARNING? IT SEEMS LIKE AN ABSURD QUESTION BECAUSE FOR MOST PEOPLE “BOOK” IS NEARLY SYNONYMOUS WITH “LEARNING.” HOWEVER, THE ANSWER IS MORE COMPLEX THAN IT MIGHT APPEAR ON THE SURFACE. WHAT BOOK? READ IN WHAT SOCIAL CONTEXT? ALL BOOKS ARE NOT THE SAME. ARE STUDENTS READING SHAKESPEARE, A GEOMETRY TEXTBOOK, AN ASTROLOGICAL GUIDE TO ROMANCE, OR THE PHONE BOOK? WHAT READING SUPPORT ARE THEY GETTING?

Learning through reading involves more than a student and a book. The book is a technology that exists in a social context. Together, the book, the student, the teacher, and other expert and novice readers the student encounters form a socio-technical system (a combination of technologies, people, and social practices). If well designed, that system may support learning.

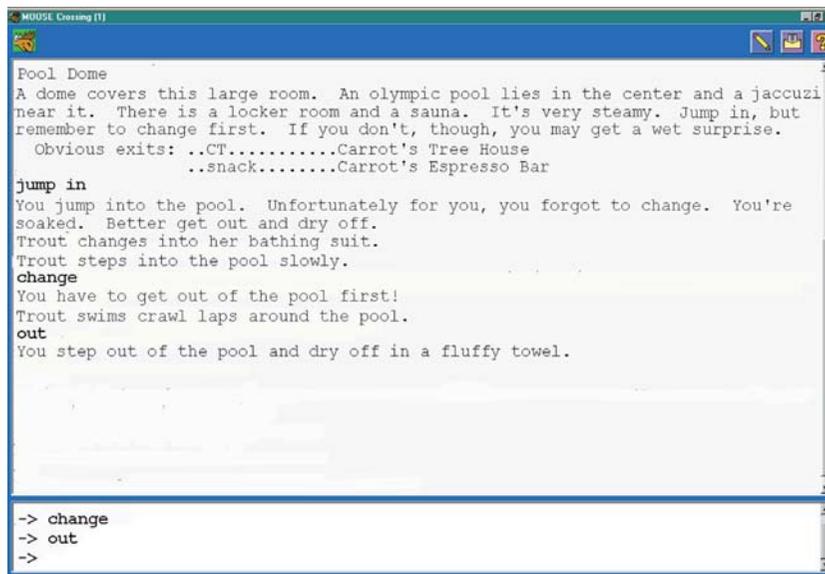
Asking if the Internet can support learning is too general a ques-

tion. The Internet is just one component of a new socio-technical system with great learning potential. Just as it matters which books students read, it matters which Internet software they use. And it matters what activities and social practices surround the process of Internet use in schools and at home. While school systems are investing heavily in Internet hardware, they have yet to invest in some of the most important components for making Internet tech-

**THE LEARNING POTENTIAL OF INTERNET TECHNOLOGY CAN COME FROM THE MOST FAMILIAR SOURCES—PEERS AND ELDERS.**

nology support learning—how to best use this technology in the classroom, innovative software tools for learning, and training teachers to learn those best practices as they come to be better understood.

What kinds of Internet-facilitated learning experiences should be supported? What are the best practices for teaching? Many educational applications of Internet technology focus on information. In distance education, information is delivered to the student. While rare institutions like the U.K.’s Open University create powerful distance learning environments, in most cases e-learning unfortunately means delivering content to



**Figure 1. A text-based virtual world where children practice creative writing and learn object-oriented programming.**

students and perhaps adding an online discussion. In online research projects, information is retrieved. In more innovative work, information is gathered by students and shared. While information-oriented applications of Internet technology are useful, the more exciting potential of this new learning medium is not about information but about community and collaboration [2]. Groups of online learners can motivate and support one another's learning experiences. How to make this possible is the subject of research in the field of Computer-Supported Collaborative Learning (CSCL) [4]. In the Electronic Learning Communities (ELC) Research Group ([www.cc.gatech.edu/elc](http://www.cc.gatech.edu/elc)) in the College of Computing at the Georgia Institute of Technology, we do CSCL research with an emphasis on constructionist approaches to learning. Con-

structionism is a theory of education that advocates learning through design and construction activities [5]. There is a natural fit between this approach to education and the affordances of Internet technology.

### Learning from Peers

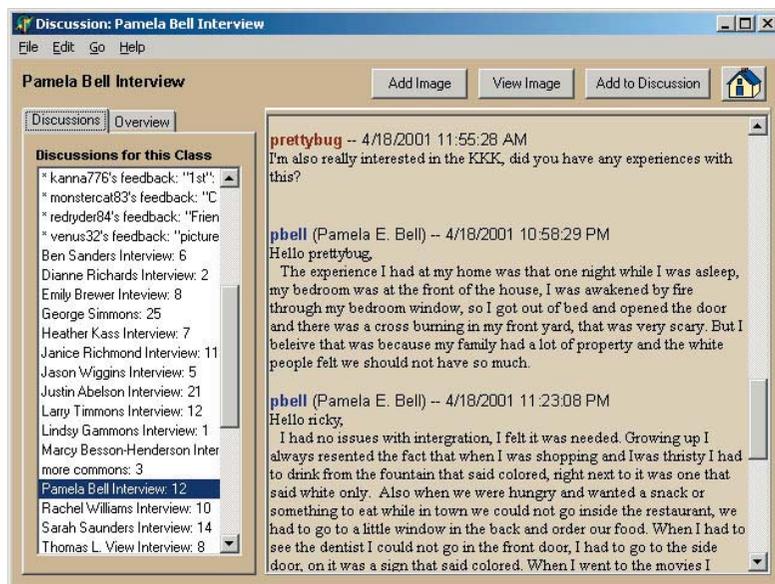
Learning is fundamentally a social process, and the Internet has a unique potential to facilitate new kinds of learning relationships. For example, in the "One Sky, Many Voices" project by Nancy Songer at the University of Michigan ([www.onesky.umich.edu/](http://www.onesky.umich.edu/)), students can learn about atmospheric phenomena from scientists working in the field [6]. More importantly, students also learn from one another—children in Montana studying hurricanes can talk online with Florida students in the midst of one. Learning from peers can be a compelling experience, and is scalable. If each child learning about atmospheric phenomena was assigned to talk

to a meteorologist, the meteorologists of the world would spend all their time talking to students and have no time left to do their own work. Songer nicely balances having children talking to adult experts and having them talk to one another. There will always be lots of peers for children to learn from.

Peers can be a powerful resource for children's learning, if activities are structured to promote productive interactions. MOOSE Crossing is a text-based virtual world (or MUD) in which children age 8 to 13 learn creative writing and object-oriented programming from one another ([www.cc.gatech.edu/elc/moose-crossing/](http://www.cc.gatech.edu/elc/moose-crossing/)) [1]. The specially designed programming language (MOOSE) and environment (MacMOOSE and WinMOOSE) make it easy for young students to learn to program. Members don't just experience the virtual world—they

construct it collaboratively. For example, Carrot<sup>1</sup> (girl, age 9) created a swimming pool complex. Using lists stored on properties of the pool object, she keeps track of who is in the pool, sauna, or Jacuzzi, and who has changed into a bathing suit. Obviously you cannot jump into the pool if you're already in the water... you need to get out first! (See Figure 1). This gives Carrot opportunities for comic writing as well as programming. The text-based nature of the environment is not a technical limitation, but a deliberate design choice: it gives children a context for using language play-

<sup>1</sup>All real names and online pseudonyms of participants have been changed to protect their confidentiality.



**Figure 2. Eighth-grade students interviewing an elder mentor about her experiences growing up during the civil rights years. (All names have been changed.)**

fully and imaginatively. Carrot enjoys inviting other kids over to the pool. They, in turn, learn about programming and writing using her work as a model. The environment attracts a diverse population of children, not just those who you would normally think would want to learn to program.

The online community provides a ready source of peer support for learning. Children learn from one another, and from one another's projects. That support is not just technical, but emotional. In answering a question, one child may tell another, "I got confused by that at first, too." The online community provides a ready source of role models. If, for example, girls are inclined to worry that programming might not be a cool thing for a girl to do, they are surrounded by girls and women engaging in this activity successfully and enjoying it. Finally, the online community provides an appreciative audience for completed work. Students get excited about being creative in order to share their work with their peers.

### Elders as Mentors

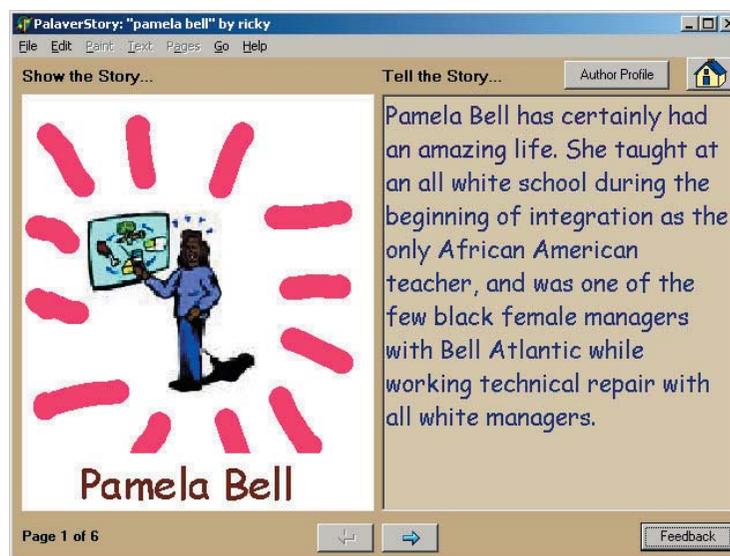
Social support for learning online can come not just from peers, teachers, and experts, but also from members of the general population who form a vast potential resource for our children's education. In particular, people who are retired have a great deal they can teach students and free time to contribute.

However, they need an easy and well-structured way to do so. In the Palaver Tree Online project ([www.cc.gatech.edu/elc/palaver/](http://www.cc.gatech.edu/elc/palaver/)), the dissertation research of Georgia Tech Ph.D. student Jason Ellis), middle-school students learn about history from elders who lived through it [3]. Teachers begin with literature that is part of their normal curriculum. Students brainstorm historical questions based on what they have learned, interview elder mentors about their personal experiences with that time (see Figure 2), and then write research reports about what they've learned (see Figure 3). In our studies to date, students learning about World War II interviewed veterans, and students learning about the U.S. civil

rights years interviewed older African-Americans. History learned from real people becomes more meaningful and relevant.

Many participating children are often disappointed at the outset: they expect to be talking to famous historical figures like Rosa Parks. Instead, they find themselves talking to ordinary people. However, as the project progresses, they come to appreciate the role history plays in the lives of real people, and the subject takes on new meaning.

Teachers prescreen elder participants, picking volunteers from a database of profiles. Most teachers are concerned about the quality of elder's historical experiences as well as their writing skills, and choose volunteers who model good grammar and spelling for



**Figure 3. The resulting project students created based on their interview.**

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the students. All conversations between students and elders are visible to all members of the community (students, elders, and teachers). While teachers have the ability to ban any elder from their class or remove any posting they deem inappropriate, the public visibility of discourse combined with the prescreening process has resulted in no teacher having to resort to such action.

Obviously, it would be better for students to meet with elders face-to-face, but in practice this rarely if ever happens. In interviews with teachers who have tried such projects, we found the logistics are too difficult to arrange for all involved. When asked if they will drive to an unfamiliar place and commit to multiple visits, elder volunteers often hesitate. However, when asked: “Would you be willing to log on for half an hour a day for a few weeks?” they are enthusiastic. The Palaver Tree Online community makes participation relatively easy for the elders, students, and teachers. Teachers are already overwhelmed with work, and any successful school-based learning technology needs to make their lives easier, not more difficult.

### New Social Possibilities

Culture and technology coevolve. Computer professionals catalyze this process. The artifacts we create foster new social practices—whether we intend them to or not. The challenge as we move forward is to develop a vision of what is possible; to understand the more and less desirable outcomes, and try to steer in the right direction. Of course, defining what direction is correct is tricky, and computer scientists aren’t necessarily the people best prepared for the task. However, we have no choice but to do our best, and to consult as much as possible with social scientists and our target users.

In the realm of online learning initiatives, we need to focus on developing learning technologies that foster creativity and independent thinking. Preparing our children to answer fact-based, multiple-choice

questions is not adequate training for life. We also need to pay respect to the important role that teachers play and the challenges they face, and design technologies that support them in their practice. Finally, we need to view learning as fundamentally a social process. The Internet has unique affordances to support the creation of new communities of learners. Its power lies not in delivering content, but in creating a context for mutually supportive communities of learners to form. Today, children learn primarily from teachers and classmates of the same age from the same geographical area. Learning will increasingly involve partnerships across ages and across distance. A thoughtful combination of technology, pedagogy, and social practices can make new kinds of learning experiences not only possible but easy to achieve in real classrooms. ■

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AMY BRUCKMAN (asb@cc.gatech.edu) is an assistant professor in the College of Computing at the Graphics, Visualization and Usability (GVU) Center of Georgia Institute of Technology, Atlanta, GA.

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The Future of e-Learning: a shift to knowledge networking and social software by Mohamed Amine Chatti. Our journal article has been published. The article can be downloaded, and your comments are welcome!Â Bob Johansen shares techniques the Institute for the Future has been refining for nearly forty years to help leaders navigate what, borrowing a term from the Army War College, he calls the VUCA world: a world characterized by volatility, uncertainty, complexity, and ambiguity. As the instituteâ€™s ten-year forecast makes clear, leaders now face fewer problems with neat solutions and more dilemmas: recurring, complex, messy, and puzzling situations. Growing from distributed learning are learning communities. Chris g'es on to describe how three complementary interfaces will shape how people learn, and provides a vignette set in the future to show how these interfaces can enable distributed learning communities for students. A look at the current situation with e-learning is provided by our Applications stories and other feature article. Sue Cooper of Anna McDonald Elementary writes of something more prevalent in these days of accountability: using the Web to determine what students know and are able to do. The use of technology takes