

## **Future Online Teachers' Scaffolding: What Kind of Advanced Technological Innovations Would Teachers Like to See in Future Distance Training Projects?**

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This study examined and organized comments made by teachers participating in a variety of learning communities to sort a list of recommendations for future development of web-based teachers' training, taking into consideration possible trajectories of web powerful technological innovations. The comments are organized under a theoretical framework of professional scaffolding.

In recent years, several studies have examined the potential impact of distance learning through the World Wide Web (WWW or Web). Some offer optimistic views of the potential benefits of today's web training services (Owston 1997), and some scrutinize the Web disadvantages and drawbacks (Roschelle & Pea 1999). Although these articles offer valuable advice and trajectories about today's and tomorrow's state of web-based distance learning, they recognize that the Web is changing rapidly both on the users front and the technologies being implemented (Fetterman, 1998). They do not provide, however, a sense of where the users of online-based distance learning services would like to go. They do not provide the users point of view on their future needs and genuine preferences.

Moreover, the existing studies address one type of end user of web learning services—the student. They tend to wrap together teachers and students as one type of online learner. This article focuses on the needs of teachers as a separate entity of web-based distance learner.

Such prospective information about emerging teachers' priorities and necessities is important for the educational research community. It is the authors' intention to highlight briefly essential concerns of teachers participating in web learning experiences. This article examined comments made by teachers participating in a variety of learning communities to sort a list of recommendations for future development of web-based teachers' training, taking into consideration possible trajectories of web-powered technological innovations.

### PRESENT STATE

For better organizing the arguments of this article, the framework in Roschelle and Pea's (1999) article is reused. Likewise, the account is somewhat pessimistic about the utility of today's web tools for teachers' distance learning needs. We have been watching comments posted by active teachers in electronic and distant learning communities to identify desired innovations.

We have been gathering phrases from teachers' discussion groups, chats, and bulletin boards in various teachers' training projects in Israel and the US. In these phrases, the participating teachers expressed implicitly or explicitly comments that might more closely connect training needs and the properties of technologies. Here are the main points summarized around the framework described by Roschelle and Pea (1999). The following arguments describe the state of distance learning today:

1. *Can distance training make teacher's training more accessible?*

The participants agree that although distance and time are not the primary impediments to access to learning resources in K-12 education, it is a primary barrier for teachers seeking continuous inservice training ([www.electricschoolhouse.com](http://www.electricschoolhouse.com)).

2. *Can distance training promote improved teaching?*

Many participants are critical of the idea that the Web, as the primary venue of today's teachers' distance training by itself, can provide tools to better teach higher-order skills such as problem solving, critical thinking, or even teamwork. Teachers contend that the training programs fail to provide them with tools that can help them in the overwhelming task of imposing meaningful structure from information available. They claim that they find themselves investing most of their resources looking for additional tools that will help them organize the information they have learned into a credible chain of argument or theoretical framework that could enhance their teaching (<http://wise.berkeley.edu/WISE/welcome.php>).

3. *Can distance teachers' training programs help contain costs?*

Fewer educational software companies throughout the world seem able to take on distance training projects with significant research and development risks. Most of the communities of teachers available today are projects supported by public funding, research institutions, or national endeavor with ministerial covert (Passig, 1997) ([www.netschool.co.il](http://www.netschool.co.il), [www.ramat-hasharon.k12.il/education\\_dep](http://www.ramat-hasharon.k12.il/education_dep)). A substantial effort needs to be undertaken by large software industries to reduce the costs of production, and create new and more efficient distribution channels for teachers training. It seems that the industry does not recognize yet the potential opportunity hidden in this market ([www.tappedin.sri.com/info/concept.html](http://www.tappedin.sri.com/info/concept.html)).

## THE FRAMEWORK

This research collected over 300 short phrases describing anticipated and desired developments in tools for distant learning communities. In reviewing the phrases, four major clusters of desired change in today's distance learning services and technologies, described as wishful notions were identified. These notions reflect similar models found in teachers' training literature. These phrases are organized under the three suggested vectors addressed by Roschelle and Pea (1999) along which leading researchers and corporate developers are heading. In addition, a fourth vector to the framework is added, based on Fox's (1995) model of teachers' professional growth.

Fox (1995) suggested a model reflecting the foci of teachers' professional development, which has been developed over the years: the *psychological*, the *professional*, the *sociological*, and the *socio-psychological* focus.

1. The *psychological* focus deals mainly with the teacher's professional development, and is closely related to his or her stages of development as an adult. This focus is also connected to the emotional needs and interests of the teacher. Throughout the years, models were developed to describe the connection between the needs of the "I" and the needs of the teaching situation, and later on the needs of the students—the passage from the focus on the self through concentration on the task, to the focus on the learner. The latter being the stage of professional maturity.
2. The *professional* focus touches on professional development that begins in the wake of the teaching process, which is characterized by the acquisition of knowledge. Emphasis on this focus is placed on the process that allows for both personal and professional development. Guskey

(1991) pointed out that professional development is an individual process, which demands effort.

3. The *sociological* focus underlines the assumption that the surroundings exert a great deal of influence over an individual, which is the first circle. However, after initial training and initial stages of teaching another circle opens—that of building skills as part of a community. At this stage, teachers exhibit a desire to improve. The next circle, that of enthusiasm and growth leads to professional development and continual updating.
4. The *socio-psychological* focus is integrative in that the path of exchange and change opens into new experiments and challenges. The professional level of teachers and the strength of their motivation that take part in the process of change are dependent on their level of professional development.

### DESIRED INNOVATIONS

In our research, we have found notions and comments reflecting these four foci of professional development. The public comments of participating teachers in the various communities we have monitored (see the Appendix for a sample) embedded a desire to see technological innovations that would promote professional growth through distance education. The teachers associated relevant growth in distance training with relevant technologies that somehow mimic professional development in the real world training. We have organized their wish phrases into the following wishful technological vectors.

1. *Toward advanced psychological and emotional scaffolding.*  
When two people are engaged in a common learning experience with a mentor or teacher, there is a rich interchange of graphical, emotional, and verbal representations. Body language, gestures, and linguistic reference to aspects of these representations are fundamental parts of the process of the making of contact, which produce meaning. These representations made during learning experiences become essential annotations from a higher level than just markings on a blackboard.  
Teachers participating in various distance learning forms of training wished there were technological innovations that support the representation of emotions and gestures in a collaborative manner. These might include software and hardware that transfer emotions, such as a recent

project at IBM. A group of user interface scientists succeeded to develop a mouse that feels stress coming from the hand of the user and share a representation of that stress over the net to other colleagues working on the same project at the same time ([www.almaden.ibm.com/cs/blueeyes/mouse.html](http://www.almaden.ibm.com/cs/blueeyes/mouse.html)).

2. *Toward advanced professional scaffolding.*

Teachers wish that tools for learning communities moved beyond forums and billboards for exchanging information and opinions. They wish technologies could capture in the background knowledge relevant to specific subject matter and accumulate it into new structures that will contribute to the shared knowledge of the community and constantly elevate its growth. These might include various types of invasive codes that enable the system to learn the profile and preferences of a specific community of learners and provide their common interest through another variety of *bots* or information *agents*. These might include services such as R U Sure ([www.rusure.com](http://www.rusure.com)) geared toward knowledge mining. R U Sure accompanies the shopper on the Web. When one of its supported sites is entered, the AutoPilot wakes up and a window opens, requesting choice of a product. R U Sure is an online search, which runs in the background and searches a significant quantity of stores. After finding the desired product, such as a book, for example, R U Sure starts crawling in the background, comparing prices at its supported sites. The pop-up window shows the prices already found, and then lower prices as they are discovered. When all the sites have been searched, it announces the lowest price. Another window shows the total cost including shipping charges, and provides a link to the site with the best deal.

3. *Toward advanced sociological scaffolding.*

Teachers express in various ways a craving for innovations that involve some type of a Recommending System, which can extract valuable information from the patterns of usage of Internet resources. For example, by noticing which downloadable classroom activities are most often mentioned in a discussion forum, a recommending system might be able to help new teachers more quickly find the best resources in a vast archive. A possible direction involves tools to allow contributors to share partially and completed resources, and enables others to improve upon them. One such technology is being developed by CILT. The CILT Knowledge Network is a repository of information for, by, and about learning technology researchers, developers, and practitioners. One can use CILTKN (<http://kn.cilt.org>) to find out more about the who, what, where, and why of learning technology.

4. *Toward advanced socio-cognitive scaffolding.*

Throughout history, great teachers have been defined as mentors who succeeded to burn the flame of the soul, and engaged the student in a never ending thirst of new knowledge. Participating teachers in online training projects recognize that typical online chat, bulletin board, and data based systems do not inflame motivation for professional growth. They merely organize conversation for learning. Teachers wished there were technological innovations that generated motivation in a cyber manner. These might include software and hardware that provide the learner with a totally new form of knowledge and online experience, such as a recent project at Bar-Ilan University in Israel. The aim of the study was to investigate whether instructions through a virtual reality (VR) 3D-simulation model of various cognitive aspects of toddlers increase the teachers' professional knowledge (now available at <http://faculty.biu.ac.il/~passig/vrprojects.html>). The immersive VR simulation being delivered through the net provides kindergarten teachers with the ability to better consider and understand children's perceptions and feelings as well as their cognitive and emotional needs, thereby increasing teacher effectiveness and efficiency in the kindergarten classroom.

## CONCLUSION

How can we use technology to support genuine learning experience? How might tools reconstruct dynamic abilities of expert tutors and mentors? These are the cores of the questions that providers of future distance training services need to answer, if they wish teachers to continue using their programs. Although the web may be attractive for some teachers' training now, we believe that there already exists, as demonstrated, technological innovations that can better advance the learning experience to a genuine level. These innovations can enhance the effectiveness of online training programs in the near future. In the case of the Internet, with its explosive rate of growth and innovation, we believe that it remains to be seen whether or not we implement timely innovations.

## References

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## APPENDIX

Just to name a few teachers' distance learning communities:

Teaching Teleapprenticeship Project (TTa) at the University of Illinois at Urbana-Champaign <http://www.ed.uiuc.edu/projects/tta>.

The Mathematics Learning Forums provide elementary and middle school teachers to reflect on and refine their mathematics teaching practices through on-line seminars <http://www.edc.org/CCT/mlf/MLF.html>.

A free online network of teachers, sharing their experiences and tips on effectively using technology in the classroom. It is geared towards serving K-12 educators [www.21ct.org](http://www.21ct.org).

The AT&T Learning Network® is an award-winning program that links teachers, parents and schools to the technology tools and support they need to help improve teaching and learning. <http://www.att.com/learning-network>

Ed's Oasis: Classroom Support for Classroom Internet Use. This site is designed specifically to help teachers use the Internet and with integrating projects into the classroom. <http://www.EdsOasis.org>

Educast: The Education News Services for Teachers and Administrators. Educast is an "Internet broadcast service" you can install on your computer. [www.educast.com](http://www.educast.com)

The Global Schoolhouse. This site is for the well-connected educator. It contains articles and features on educational technology. Also, teachers are welcome to submit their favorite web sites. [www.globalschoolhouse.com](http://www.globalschoolhouse.com)

Global School Network. The Global School Network (GSN) provides access to a variety of topics and subject areas. Included at this site are resources for teachers, discussion groups, and a World Wide Web tutorial. [www.gsn.org](http://www.gsn.org)

Teachers Helping Teachers. This site hosts a place for teachers to contribute lesson plans, book reviews and educational links. It's a place where educators make recommendations to each other <http://www.pacificnet.net/~mandel>