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Introduction

Distance learning is education mediated by technology that takes place when participants are separated by space and/or time. Distance learning can take many forms, depending on the type of program and technologies involved. For instance, a course or program can be conducted completely through distance learning, or distance learning can be used to supplement face-to-face meetings. Distance learning can involve having participants meet at the same time in different locations (synchronous distance learning), or having participants work at their own time (asynchronous distance learning). Modes of collaboration supported by distance learning can include resource sharing, to open-ended and focussed discussions, and mentoring. Technologies used to support distance learning include print, telephone, broadcast television, one-way and two-way video, computers, and the Internet.

This paper summarizes findings from a review of a variety of distance learning programs that have been developed in the U.S. The purpose of this review was to identify key features of the design and implementation of these programs that have contributed to the creation of meaningful learning experiences and their sustainability. The distance learning programs that were included in this review came from a variety of sectors in education, including elementary and secondary education, teacher education, adult literacy education, and community-based education.

What Motivates Program Providers to Use Online Distance Learning?

Program developers cite several key reasons for the creation of distance learning programs:

• Distance learning makes it possible to reach learners that are difficult to reach through traditional educational programs (e.g., participants who don't have the time or resources to attend classes; or physically disabled participants who can't easily travel to a school or community-based organization)

• Distance learning can support and facilitate new forms of learning (e.g., collaborations across distances).

• Distance learning can provide more flexibility for participants to learn at their own pace.

• With distance learning, education is no longer tied to a specific place (e.g., a school). Distance learning, especially when conducted through computers, can take place anywhere (e.g., at home, at work).

• Distance learning can broaden the availability of educational programs that are available in resource-poor communities (e.g., rural communities, poor inner-city communities).

• Asynchronous distance learning programs allow learners to participate in educational programs at their own time.

• By using distance learning technology as the delivery medium, participants experience and learn about the use of new technology.

Sample Projects

The following projects illustrate the range of distance education projects that have been developed for elementary and secondary education, teacher education, and community-based education.

1. Virtual Schools for K-12 Students

The *Virtual High School(VHS)* is a nationwide collaboration of public and private high schools that offers more than 100 Internet-based high school courses to students in participating schools. The Virtual High School was conceived and developed by the Concord Consortium in collaboration with the Hudson Public School District. The development of the VHS model was supported by a 5 year grant from the U.S. Department of Education.

The basic structure of a NetCourse in the VHS involves one teacher with 20 students. Each NetCourse is one semester long, and many of them are offered twice a year, i.e. once each semester. NetCourses are asynchronous within the constraints of a weekly schedule. Many of the NetCourses are elective specialty courses that otherwise would not be available at the participating schools. Students are selected for participation by their schools. Schools are encouraged to select students who have above-average independence and perseverance. A large proportion of the students who have participated so far are 12th graders and plan to attend a four-year college.

Teachers are the authors of the courses they teach online. They receive extensive professional development during the year prior to teaching online. The professional development is a comprehensive, 125 contact hour graduate-level course which is conducted online, using the same tools that teachers will use in their NetCourses. As part of this course, teachers learn about the use of the technology, the design of online courses, and all aspects of facilitating online learning. The VHS encourages the participation of experienced and organized teachers. Teachers who like to invent things at the last minute are not encouraged to participate as online teaching requires careful preparation and thoughtful interactions based on reading everything every student writes. Teachers are motivated to teach online because it represents an opportunity for them to teach specialty courses that otherwise they wouldn't get to teach. It also provides them with an opportunity to use technology in education and to gain technological skill.

The VHS has a cooperative structure: each school in the cooperative contributes at least 20% of a teacher's time to develop and teach a course on the Internet. Schools also donate computers, Internet connectivity, and staff time for an on-site coordinator. The

VHS site coordinator is responsible for project management, recruitment, and support of teachers and students at their local school. Many schools schedule their VHS students into a computer lab at the same time where they are under supervision of the site coordinator. The site coordinator can help with technical problems, facilitate student thinking, and remind them of due dates. Each school in the cooperative can enroll 20 students to take NetCourses for each period of a teacher's time they contribute to the pool. This cost model was developed to be compatible with the ways schools are financed. Project-wide issues of VHS school policy, governance, and site-coordinator communications are coordinated by staff at the Hudson Public Schools. The Concord Consortium offers the professional development course for teachers, handles enrollment, and provides technical services.

The VHS project has involved extensive evaluation research conducted by an external evaluator. Evaluation methods have included online surveys, site visits to participating schools, reviews of documentation, interviews with staff, and an expert panel review. Evaluation research has focused primarily on documenting participants' attitudes about the NetCourses and on establishing the quality of the courses offered. The results indicate that satisfaction is high among students, teachers, and administrators. Teachers and students alike perceived a number of benefits of the VHS: the availability of an increased range of courses, the flexibility offered by the asynchronous courses, and the opportunity to learn about technology. An expert panel reviewed and rated a selection of the courses offered online and found that 11 out of 12 courses were satisfactory or high quality.

Detailed description of the program:
http://vhs.concord.org/Pages/About+Us-What+is+VHS+(VHS+October+1998)

Visit a demo NetCourse:
http://vhs.concord.org/Pages/Academics-Explore+a+Class

Catalog of course offerings:
http://vhs.concord.org/Pages/Academics-VHS+Catalog+(00-01)

Evaluation reports:
http://vhs.concord.org/Pages/About+Us-Project+Evaluation

Other online schools:
Florida Online High School
http://www.fhs.net

Kentucky Virtual High School
http://www.kvhs.org

A listing of 50 U.S. based Virtual High Schools, including short descriptions and links to their web sites can be accessed through the Wisconsin State Education Department at: http://www.dpi.state.wi.us/dpi/dlsis/vistate.html

2. Distance Education for the Professional Development of Teachers

Mathematics Learning Forum
The Mathematics Learning Forums are online in-service courses for elementary and middle school teachers that are designed to help them reflect on and refine their mathematics teaching practices in accordance with current nationwide mathematics reform efforts. Each forum focuses on mathematics classroom practices, providing ongoing support to teachers as they implement these practices in their classrooms.

Each forum is hosted by a faculty facilitator from Bank Street College of Education. The facilitator's role is to raise questions, guide discussion, and provide reflective commentary. Facilitators are trained through an online course that includes a simulation of a learning forum and facilitated discussion about issues that arise when communicating online.

Centerpieces of each forum are learning activities that are exchanged online and that participants are expected to implement in their classrooms. Participants use online discussion tools (threaded discussions and listservs) to actively exchange ideas, share concerns, and construct new understandings about these activities. Some forums involve videos of classroom events that are mailed to the participants and that can be viewed with a VCR. Forums focus on topics such as: mathematical content, student learning, teaching strategies, and assessment techniques.

Each Mathematics Learning Forum is conducted over an 8-week cycle and has a detailed schedule, with specific activities to be completed every week. During each week, however, participants work asynchronously on their own time and at their own pace. Enrollment is limited to 12 participants per forum. Participants are expected to spend a minimum of 3 hours a week actively contributing to and shaping the online discussion. Forums can be taken for graduate or professional development credit (i.e., for working towards a degree, or to satisfy professional development requirement) or personal enrichment.

The model for the Mathematics Learning Forums was developed between 1993-1996 by the EDC/Center for Children and Technology in collaboration with Bank Street College of Education with funding from the Annenberg/CPB Math and Science Project. The overall goal of this collaborative effort was to develop an alternative to traditional correspondence courses where information exchange tends to be unidirectional from one person (the instructor) to a large group of individuals enrolled in a course. The Mathematics Learning Forums model was designed to promote more immediate, personal and flexible communication among all participants within an online course.

Evaluation research that has accompanied the development of the Mathematics Learning Forum model focused on participants' assessment of the usefulness of the online learning experience. Overall, participants found the online format useful and especially welcomed

the opportunity to share their experiences with a community of peers. The fact that the forum participants came from different schools made it easier for them to talk about difficulties they were having teaching math to their students and issues they were struggling with. The degree to which participants found the online learning experience useful was a function of the accessibility of the technology and their experience with the technology. The more experienced participants were in the use of online communication and the more access they had to the technology (especially home access), the more useful they found the forums to be.

Description of the program:
http://www.bnkst.edu/html/mlf/index.html

Visit a sample forum:
http://www.bnkst.edu/html/mlf/look.html

List of course offerings:
http://www.bnkst.edu/html/mlf/course.html

Other online professional development programs:

National Center for the Improvement of Practice (NCIP) is an online community of educators linked through facilitated discussion forums, online workshops and events, with access to an online library of print and video resource materials. The focus of this community is on improving educational outcomes for students with disabilities by promoting the effective use of assistive and instructional technologies among educators and related personnel serving these students. NCIP was developed and hosted by the Education Development Center.
http://www.edc.org/FSC/NCIP

Schools Around the World (SAW) is an international community of science and math teachers that come together to share and discuss samples of student work and to reflect on their teaching practice. In addition to online discussion forums, the program includes a database of student case materials and online seminars. The project was developed by the Council for Basic Education in collaboration with the EDC/Center for Children and Technology.
http://www.edc.org/CCT/saw2000/

Science Online is an online science education master's degree program for elementary and middle school educators, developed by TERC and Lesley College. The program involves multiple teachers from each site to facilitate off-line collaboration in addition to online collaboration.
http://www.lesley.edu/soe/science

TAPPED IN is an online workspace for teachers hosted and supported by SRI. Teachers can use the services TAPPED IN offers to plan and conduct projects with colleagues and

students, participate in or lead topical discussions, conduct or attend courses, and find resources, experts and colleagues.
http://www.tappedin.sri.com

3. Distance Education in Youth Organizations

iEARN is a non-profit organization with the purpose of assisting youth between the ages of 5 and 18 years of age to engage in collaborative telecommunications projects which make a meaningful contribution to the health and welfare of people and the planet as part of the educational process. The goal is to help students develop the habit of getting involved in community issues and to better equip them for future citizenship participation through participation in iEARN projects

iEARN was developed by the Copen Family Fund in 1990 as an expansion of the earlier New York State/Moscow Schools Telecommunications Project. The purpose for creating this program was to explore the potential of distance learning technology to provide the opportunity of linking millions of youth and to enhance collective problem solving around issues affecting the global community in areas such as population, environment, racism, distribution of wealth, hunger and poverty, violence and terrorism, economics and military spending.

Participating schools and youth organizations are linked via electronic mail and interactive online conferences (newsgroups). Most have access to the World Wide Web and other Internet resources. Some of the participating organizations are also linked by video-conferencing and face-to-face exchanges.

The content of each iEARN project is designed by participants to fit the needs of the collaborating organizations, such as their schedules, curricula, and classroom needs. Participants may join existing project or collaborate with others to create their own projects that fit their particular needs. All iEARN project involve the production of a final product or exhibition to document the learning that has taken place as part of the project. Final products have included magazines, creative writing anthologies, web sites, letter writing campaigns, reports to government officials, arts exhibits, workshops, performances, and charity fundraising.

In order to participate, participants need to join iEARN for an annual membership fee. Once an organization is a member, the network is open to all teachers and students at that organization.

iEARN offers professional development workshops for educators who want to create or participate in its projects. These workshops are hands-on and are conducted by experienced trainers. As a follow up to this training, iEARN offers ongoing technical and staff development assistance from iEARN staff and an online community of colleagues.

An independent evaluation of the initial New York State/Moscow Schools Telecommunications Project indicated that compared to a control group, participating students were more likely to discuss political or social issues and international events, read more books and news magazines by authors from other countries, were more aware of international issues and current events, and to enroll in second language courses.

A detailed description of the program can be found at:
http://www.iearn.org/home.html

List of iEARN projects:
http://www.iearn.org/projects/project_list.html

View sample projects:
http://www.iearn.org/about/about_programs.html

Features of Successful Programs
The success of a learning experience can be defined in many different ways. For the purposes of this review, I have chosen to focus on the following key features of success, which reflect the kinds of standards that distance learning programs have held themselves accountable for. Furthermore, these standards are consistent with key themes in current national standards for learning in the U.S. such as the National Science Education Standards (NRC, 1996), and the Principles and Standards for School Mathematics (NCTM, 2000).
•   The distance learning program is sustained over time;
•   Participants are actively engaged in the online learning experience;
•   Participants achieve the desired learning outcomes;
•   The online learning experience serves *all* learners.

Programs that have been shown to be successful in these ways, have included the following design features:

• The distance learning program addresses an important need for the participating learners and/or organizations. For instance, the Virtual High School makes it possible for schools to meet the demands for a broader course selection. Formal incentives for participants can help to sustain their participation. In teacher education, for instance, the award of graduate or professional development credit can help to make participants feel responsible for the requirements of an online course.

• Participating organizations in different locations share responsibility and commitment for the implementation of the program. For instance, in the Virtual High School participating schools must contribute a certain number of courses in proportion to the number of students that can be enrolled in the online courses.

• Communication and collaboration are used as tools to address a perceived need, rather than as an end in itself. For instance, pen-pal exchanges that simply match up participants for the purpose of communicating with each other are often not sustained

over time for lack of shared interests, activities, and common focus among participants. The Mathematics Learning Forum Project has successfully used activity-based content to provide a context for collaboration and communication. Providing participants with activities to implement on line or off line, creates opportunities for sharing, comparing, and reflecting on variations of a common experience within the online community. A key component of the Mathematics Learning Forums is the exchange of learning activities that teachers can modify and use with the students in their local classrooms. In this way, teachers are invited to experiment and innovate in their classrooms and to share their experiences and provide feedback within a supportive community of online peers. As another example, the SAW project uses a shared database of student case materials to engage teachers from around the world in the assessment and discussion of the quality of students' work.

• Online programs are tightly focused and expectations are clearly established at the outset. Participants should know ahead of time how much time they are expected to be online per week, the kinds of tasks and activities they are expected to engage in, and the kinds of products they are expected to produce. A week-by-week schedule for how the online learning experience will unfold has been found helpful in online courses.

• The online learning community is facilitated by a skilled moderator. Moderators need to work hard to build a community among learners who have never met as well as to maintain participant interest. Effective moderators have strategies for including all members of the group; for inviting participation in discussions; for encouraging cross-discussion, from one participant to another; for keeping discussions on track; and for conveying and perceiving meaning without visual clues.

• Moderators are well trained and prepared. They understand the affordances of the medium and use it well. For instance, all teachers who teach Virtual High School courses, take an online course to learn about course design and facilitation of online communication.

• While it is not impossible to build and maintain an online learning program among participants that never meet in person, online learning often works best if it is used as one component of an educational program that also includes opportunities for face-to-face meetings. Some distance education programs build in face-to-face collaboration by involving multiple participants per site, by offering off-line collaborative activities for local participants, and by offering local support.

• The online program has a clear timeframe that is compatible with the lives of the participants. For instance, 6-8 weeks has been found successful for professional development of teachers.

• The online learning community is not too small and not too large. 12-25 participants have been found workable for online courses in teacher education. There need to be enough participants to generate active participation in discussions, but not so many that the work of reading participants' messages becomes overwhelming. Limiting the size of

the online program will help participants to develop a better understanding of who their on-line partners are.

• It is helpful to have a variety of tools/channels to facilitate communication (email, chat, conferencing) and the ability to create private workspaces (for personal conversation or small group discussion).

• The technology is easy to use and technical support is available on-line and off line. Local support is particularly important for users who are new to distance learning to help them get off to a smooth start.

• An emphasis on equal learning outcomes for diverse learners, needs to be an integral part of the distance learning culture, including the provision of access to distance learning technology (i.e., access to hardware and the internet), the selection of participants, the design of the content or curriculum of the distance learning experience, the distance learning pedagogy and practice, and the program evaluation.

Promising Approaches to Evaluating Online Learning Environments
• Begin with a needs assessment. Use interviews, group discussions, and/or questionnaires to determine the scope of the problem/need to be addressed, the range of desired outcomes, and the full range of strategies that might be used to bring about the desired outcomes.

• Test the feasibility of the approach. Prior to devising a technical approach for a program, identify technical and organizational barriers as well as management issues through conversations with key stakeholders.

• Conduct research from the outset. Timely and well designed evaluations can help programs to determine whether and to what extent their goals have been achieved, to identify areas where the program needs improvement, and to attract additional funding.

• Go beyond assessing teachers and students' attitudes about the distance learning experience. Examine the quality of the interaction among participants and assess their learning. For instance, some online professional development programs now try to assess the impact of the online experience on teaching practice by conducting classroom observations after teachers' participation in an online workshop.

• The use of the online medium facilitates the collection and analysis of data, that can provide useful feedback to students and help teachers/facilitators in their instructional planning. Distance learning technology such as the internet makes it possible to collect and archive all work that is done online, including interactions. The technology also supports the use of student portfolios and performance-based assessment. Data about attendance and participation, use of assignments and resources, quality of student work, and patterns of interaction are easily accessible. The use of the online medium also make it possible to conduct online surveys which are easily administered and can be

instantaneously analyzed, which makes them a particularly useful tool for formative evaluation.

• Collect the data necessary to determine how the distance learning experience serves different learners. Break down data on participation and learning outcomes by gender, ethnicity, race, socio-economic status, disability, etc. to examine how and in what ways different groups are being served.

Directions for the Future

1. Broaden the types of participants served
Many distance education programs are being offered with the intent of broadening access and educational opportunities for traditionally underserved populations. In reality, however, many distance education programs are serving only a fairly narrow range of learners, namely those who are independent and academically advanced. Future projects should try to develop models that better serve disadvantaged populations. To do so, equity must be considered from the outset and be integral to the distance learning culture. Projects should develop an equity impact statement, that includes plans for recruiting participants, providing an equitable learning experience, utilizing technology that is accessible to all learners, and evaluating how the project serves diverse learners.

2. Develop new tools
While technology by itself can't make collaboration happen, it can if well designed, play a crucial role in supporting well designed collaborative learning environments. The technology that exists today is still in its infancy and by no means utilizes the potential it has to support collaborative processes. Distance learning technology needs to be accessible to all learners, including students with disabilities. This includes the exploration of alternatives to text-based communication. Roschelle and Pea (1999) see potential in the development of three major types of tools: tools for building shared representations, tools that facilitate the organization and linking of shared knowledge, and tools that support the snythesis and analysis of information.

3. Conduct more in-depth research
Research conducted to date is scarce, and leaves many questions about distance education unanswered. Future projects need to develop more refined research methods to obtain data that can guide educators and policy makers in their use and improvement of distance education approaches. Key questions that should be addressed by future projects are: How can distance education be used to suit different learners and the demands of different subject areas? And how can distance education, in the absence of same time, same place instruction, support the development of deep understanding of difficult material that goes beyond amassing facts?

<center>**Resources**</center>

Online Pedagogy
Collison, G., Erlbaum, B., Haavind, S., & Tinker, R. (2000). *Facilitating Online Learning: Effective Strategies for Moderating.* Madison, WI: Atwood Publishing. Ordering information available online at:
http://www.atwoodpublishing.com/books/160.htm

Northeast and Islands Regional Educational Laboratory at Brown University, National School Network, Teacher Enhancement Electronic Community Hall (1999*). Electronic Collaboration: A Practical Guide for Educators.* Providence, RI: LAB at Brown University. Available online at: http://www.lab.brown.edu/public/pubs/collab/elec-collab.pdf

Palloff, R. M. & Pratt, K. (2001). *Lessons from the cyberspace classroom.* San Francisco, CA: Jossey-Bass. Ordering information available online at:
http://www.JosseyBass.com/catalog/isbn/0-7879-5519-1/

Pattison-Gordon, L. (nd). *Best practices in collaborative technology.* Available online at: http://www.lab.brown.edu/ocsc/papers/Networked.collab.content.html

Spitzer, W., Wedding, K., & DiMauro, V. (1994). *Fostering Reflective Dialogues for Teacher Professional Development.* Cambridge, MA: TERC. Available online at: http://www.terc.edu/papers/labnet/Guide/Fostering_Refl_Dialogues.html

Program Design
Higher Education Program and Policy Council (2000). Distance education: Guidelines for good practice. Washington, DC: American Federation of Teachers. Available online at http://aft.org/higher_ed/technology

Guernsey, L. (2001), Teenagers try online learning. *New York Times*, February 15, 2001. Available online at:
http://www.nytimes.com/2001/02/15/technology/15SCHO.html

Honey, M., Dubitsky, B., Bennett, D., Hupert, N., Meade, T., Cohen, M., Melnick, H., & Peterson, L. (1996). *The Mathematics Learning Forums Project.* New York: EDC/Center for Children and Technology.

Tinker, R. & Haavind, S. (1997). *Netcourses and netseminars: Current practice and new designs.* Concord, MA: The Concord Consortium. Available online at: http://www.concord.org/library/pdf/netcours.pdf

Research
Campbell, P. B., & Storo, J. (1994). *Reducing the distance: Equity in distance learning.* Groton, MA: Campbell-Kibler Associates.

Grimaldi, C., Hawkins, J., Dyer, P., Moeller, B., Thompson, J., Baker, T., & Weikert, L. (1996). *Distance learning evaluation: Final Report 1994-1995, New York City, NY.* Technical Report No. 12. New York: EDC/Center for Children and Technology. Available online at: http://www2.edc.org/CCT/cctweb/public/include/pdf/11_1996.pdf

Hawkins, J., Grimaldi, C., Baker, T., Dyer, P., Moeller, B., Thompson, J., (1996*). Distance learning evaluation: Final Report 1994-1995, Dutchess County, NY.* Technical

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National Institute for Literacy (2000). *How states are implementing distance education for adult learners.* Washington, DC: National Institute for Literacy. Available online at: http://www.nfli.gov/policy/distance.htm

Pape, L. (1999). Truth or consequences: Evaluating Online High School Courses. *VHS @Concord Special Issue.* Available online at: http://www.concord.org/library/1999spring/insert-vhs/truthcons.html

Roschelle, J. & Pea, R. (1999). Trajectories from today's world wide web to a powerful educational infrastructure. *Educational Researcher*, *28*(5), 22-25.

Tobin, D. & Burns, M. (eds.) (2001). Communities Online: Building a Space for Professional Learning. *Mosaic*, *3*(1). Newton, MA: Education Development Center.

Westat (1999). *Collected case study evaluations: Summary of findings*. Washington, DC: U.S. Department of Commerce, National Telecommunications and Information Administration. Available online at: http://www.ntia.doc.gov/otiahome/top/research/EvaluationReport/case_studies/casestudy summary.pdf

Other
National Research Council (1996). *National Science Education Standards.* Washington, D.C.: National Academy Press. Available online at: http://www.nap.edu/books/0309053269/html/index.html

National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics.* Reston, VA: National Council of Teachers of Mathematics. Available online at: http://www.nctm.org/standards/principles.htm

Organizations

The ***Concord Consortium*** is a nonprofit organization dedicated to stimulating needed change in education by creating innovative opportunities to learn that use information technologies. The Consortium conducts research and development, and disseminates dynamic and successful educational tools nationwide. Its staff consists of educators from varied disciplines. Online learning is one of the Consortium's major strands of work. Most notable are the *Virtual High School* Project and *MOOM: Moving out of the Middle* Project, which offers online courses on web moderating.

Concord Consortium
37 Thoreau Street
Concord, MA 01742
Phone: 978-369-4367
Fax: 978-371-0696
email: General Inquiries info@concord.org
Web: http://www.concord.org

The *Distance Learning Resource Network (DLRN)* disseminates information about the Star Schools Program, a federally funded distance education program which offers instructional modules, enrichment activities and courses in science, mathematics, foreign languages, workplace skills, high school completion and adult literacy programs. Among other things, the DLRN provides general information about distance education, provides online tools to assist with designing courses for web-based instruction, and online discussion forums.

Distance Learning Resource Network
2020 North Central Avenue, Suite 660
Phoenix, Arizona 85004-4507
Phone: 602-322-7003
Fax: 602-322-7007
email: pkinder@wested.org
Web: http://www.dlrn.org

The *Education Development Center* (EDC) is an international nonprofit organization committed to promoting education, public health, and sustainable development around the world. EDC develops programs and conducts research in areas such as early child development, K-12 education, health promotion, workforce preparation, and institutional reform. Since the early 1990s, EDC has been exploring the use of new electronic media for distance learning, especially to promote professional development for educators. Key projects are the Adult Literacy Media Alliance (ALMA); the National Center to Improve Practice (NCIP); and the Schools around the World Project (SAW).

Education Development Center (Boston office)
55 Chapel Street
Newton, MA 02458-1060
Phone: 617-969-7100
Fax: 617-969-5979
Web: http://www.edc.org

SRI is an international nonprofit organization devoted to creating, applying, and bringing new discoveries to market. SRI's Center for Technology in Learning (CLT) mission is to improve learning and teaching through innovation and inquiry in computing and communications. CLT's research and development activities focus among other things on advanced technology for collaborative learning, and assessment of networked learning environment. Sample projects are *TAPPED IN* and the evaluations of the *GLOBE* and *Virtual High School Projects*.

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TERC (Technical Education Research Center) is a nonprofit education research and development organization in Cambridge, MA. TERC's mission is to improve mathematics, science and technology teaching and learning. Through its work, TERC seeks to promote creative, rigorous and reflective inquiry as an integral part of the lives of learners from diverse communities. TERC works at the edges of current theory and practice to contribute to understanding of learning and teaching, foster professional development, develop applications of new technologies, create curricula and other products, and support school reform. One of the key topics addressed in TERC's work is online learning. TERC develops tools and programs in which students and teachers access key resources through the Internet, and learning experiences take place in innovative online environments.   Key projects are *Science Online*, a Science Education Master's Degree program for teachers, and the *GLOBE* project.

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