

# Media Spaces And Their Application In K-12 & College Learning Communities

Organizers: *Louis Gomez, Barry Fishman,  
Joseph Polman*  
School of Education and Social Policy  
Northwestern University  
2115 North Campus Drive  
Evanston, IL 60208  
708-467-2821  
E-mail: l-gomez@nwu.edu

Moderators: *Rob Fish (Bellcore)  
Sara Bly (Xerox PARC)*

Panelists:  
*Yvonne Andres (Global Schoolnet Foundation)  
Sergio Canetti (NYNEX Science & Technology)  
Barry Fishman (Northwestern University)  
Joseph Polman (Northwestern University)*

## ABSTRACT

The CHI community has grappled with the design of media spaces in white collar settings for the past several years [1, 2]. This forum is intended to challenge the assumptions made by that research in light of new settings presented by schools. We explore the opportunities that exist in media space research and design for K-12 and college learning communities.

**KEYWORDS:** Media spaces, design, collaborative learning, education, networking, video.

## MEDIA SPACES FOR LEARNING COMMUNITIES

Learning communities are groups of people who come together for the purpose of inquiry and knowledge acquisition. Informal interpersonal interaction among members of the community can facilitate their construction of knowledge. The creation of learning communities is often prevented by physical distance. There is growing interest from the learning sciences and the education community in computing and networking support for communities of learners who are distant from one another. We will address this issue from the perspective of design and user-informed functionality in a CHI '94 panel. The focus of the panel will be the design of "media spaces" to support learning in K-12 and college communities.

Media space technology is the confluence of audio-video teleconferencing, shared data applications, and other networking/software technologies designed to support the sense of inter-personal presence at-a-distance. Explorations of media space design and utility for use by white-collar knowledge workers have been a fixture in the human-computer interaction community for several years. Indeed, CHI was one of the first conferences where this technology gained research popularity. Now media space technology is rapidly migrating to other venues. Education

is prime among them, as evidenced by the number of projects exploring various educational applications of media space. This panel brings three such projects together to explore design and pedagogical issues in the application of media spaces to support learning communities.

## THREE EDUCATIONAL MEDIA SPACE PROJECTS

### Learning Through Collaborative Visualization (CoVis)

The CoVis Project [3], sponsored by the National Science Foundation, uses wide band (384Kbps) ISDN networking to provide students with a "collaboratory" workbench that includes desktop video teleconferencing; shared software environments for remote, real-time collaboration; access to Internet resources; a multimedia scientist's "notebook"; and scientific visualization software. In addition to providing new technology, CoVis works closely with scientists and teachers to develop new curricula and new pedagogical approaches to science education that take advantage of rich interaction opportunities for students to use next-generation teleconferencing to build learning communities with other students, teachers, and working scientists. "Collaborative Visualization" thus refers to development of scientific understanding mediated by scientific visualization tools in a collaborative context. The CoVis Project seeks to understand how science education can take broad advantage of these capabilities, providing motivating experiences for students and teachers with contemporary science tools and topics.

### The Global Schoolhouse Project (GSH)

The GSH, sponsored by the National Science Foundation, provides an environment for students around the world to work and learn together by communicating with other students, teachers, scientists, and national and international leaders. The technologies involved are desktop video conferencing, electronic collaboration, and distance learning over the Internet. Standard Internet connections carry CU-SeeMe video, with audio carried in a separate telephone channel. In the pilot phase of the GSH project, students in grades five through eight in California, Tennessee, Virginia, and London, England worked together to study ground water pollution and its sources in their communities. They shared their findings by exchanging messages over the Internet and "met" face-to-

face once a week using videoconferencing software. Students also had an opportunity to present their findings to national leaders in a historic event that was broadcast around the world.

### **The New York State Learning Network**

The New York State Learning Network is a collaboration between NYNEX and the SUNY and CUNY higher education systems. This experimental distance education project joins students in math classrooms at the Hudson Valley Community College to students at SUNY Albany using video conferencing and data sharing tools. A design emphasis of the project was to devise control mechanisms for teachers that would allow them to conduct classes while allowing freedom of movement. While many video-based distance education projects convert the classroom into a TV studio, the New York State Learning Network preserves the normal interaction style of a college seminar. The technology suite consisted of a "teacher camera" that automatically follows the teacher's movements, a "class camera" to capture an image of the entire room, and an interactive whiteboard. The system is supported by T3 (45 Mbps) connections for audio and video and T1 (1.5 Mbps) connections for data communications.

### **MAJOR PANEL TOPICS**

A video will introduce each project and its current research and development program to the audience. This video will depict students and teachers in the daily use of the media space technologies and their commentary on its utility. The moderators will then set the historical and technical context for "traditional" media space research, establishing the tone for commentaries from each project. They will offer opinions about the applications (e.g. Is there anything new here that informs design?).

Fish and Bly's comments shape discussion around several key topics: (a) What pedagogical approaches are served/adopted by each of the media space classrooms? (b) What is the technological design context [how much bandwidth, computers, etc.]? (c) What were the key design decisions, methods, and features developed to support learning communities? (d) What are the empirical and design results achieved so far?

From their separate perspectives, each project addresses the key research issues raised by using media spaces to support learning communities. The audience is encouraged to add their critique and design recommendations for future iterations of media space applications in learning communities.

The next decade will bring widespread, networked multimedia interpersonal computing. One goal of this panel is to open a dialog in the human-computer interaction community on the effective use of interpersonal, collaborative multimedia to support pre-college learners.

### **PANELISTS**

**Yvonne Andres** is the Technology Specialist and School Based Program Coordinator at Jefferson Junior High in Oceanside, CA, and serves as the President and Director of Curriculum of the Global Schoolnet (formerly FrEdMail) Foundation. She has taught all grade levels from pre-school to university level.

**Sara Bly** is manager of the Collaborative Systems Area at Xerox PARC. Since 1986, she has participated in the PARC Media Space. Her research on media spaces has focused on connection software and uses, shared drawing, and awareness.

**Sergio Canetti** is a member of technical staff at NYNEX Science & Technology and an adjunct professor at New York University's Interactive Telecommunications Program. He has recently been involved in network-based education projects in Vermont and New York state.

**Rob Fish** is Member of Technical Staff in the Interpersonal Communications Research group at Bellcore in Morristown NJ. He has pioneered the design and evaluation of systems like Cruiser™ that support informal communication among people who are separated by distance and provide them with sense of interpersonal-presence

**Barry Fishman** is a doctoral student in the Learning Sciences at Northwestern University. His current research is on internetworking and CMC issues in educational and organizational settings.

**Louis Gomez** is Associate Professor of the Learning Sciences and Electrical Engineering and Computer Science at Northwestern University. His current research is on the application of media space technologies in high school classrooms and Internet use in public libraries.

**Joseph Polman** is a doctoral student in the Learning Sciences at Northwestern University. His current research is on the use of communications and scientific visualization technologies in high school science learning.

### **REFERENCES**

1. Fish, R. S., Kraut, R. E., Root, R. W., & Rice, R. E. Video as a technology for informal communication. *Commun. ACM* (Jan. 1993), p. 48-61.
2. Bly, S., Harrison, S., & Irwin, S. Media spaces: Bringing people together in a video, audio, and computing environment. *Commun. ACM* (Jan. 1993), p. 28-47.
3. Pea, R. D. Distributed multimedia learning environments: The CoVis project. *Commun. ACM* (May 1992), p. 60-63.