Satellite Teleconferencing Between Massachusetts and Germany

Middle school students in America and Germany advanced their science and language agendas through participation in a live video teleconference.

On June 1, 1989, 8th graders in three Massachusetts schools in the Lowell, Chelmsford, and Dracut school systems participated in a live, two-way, 90-minute video teleconference with students in Karlsruhe, Germany. This event capped a year of preparation, in which students, teachers, and project staff had communicated via electronic mail and other more traditional means on local and international environmental science issues.

During the live teleconference and throughout the year leading up to it, the American and German students exchanged information on alternative sources of power generation, toxic waste disposal, and government regulations. However, their communication was not limited to environmental science topics. They also shared their perceptions and feelings about peer pressure, sports, food and fashion preferences, music, school life, and parent/child relationships.

Organizing the KITES Partners
These students were part of an ongoing multi-organization partnership called KITES (Kids Interactive Telecommunications Experience by Satellite). Focusing on scientific and policy implications of nuclear power, KITES was initiated in early 1988 by the University of Lowell College of Education as a way to advance students' cross-cultural sensitivities and infuse the curriculum with the vitality of international perspectives. The Massachusetts Corporation for Educational Telecommunications and Massachusetts Educational Television in the public sector and the Digital Equipment Corporation in the private sector provided vital support in the U.S.

The German KITES partners—several public and private institutions collaborating under the leadership of the Pädagogische Hochschule Karlsruhe, a major teacher training institution in the State of Baden-Württemberg—had a somewhat different agenda. They hoped to provide a fresh and effective kind of English language instruction for a 9th grade English class, with environmental science providing the context in which students could practice the language. Assisted by the Pädagogische Hochschule Karlsruhe, the Nebenius Realschule Karlsruhe (a vocational training school) developed and supervised the exercises for a 9th grade English language class. Technical arrangements in Germany generally came under the direction of the national postal/telecommunications service (the Bundespost). Two state ministries of education, two German banks, and Siemens, a high technology company, provided funding.

KITES is distinguished from other teleconferences because it works with heterogeneous groups of students in all kinds of communities. Similar projects, such as Public Broadcasting Service's US-USSR Youth Summit and ABC's Junior Glasnost, feature highly select, academically talented groups of
Eighth graders in Massachusetts participate in a live videoconference with students in Karlsruhe, Germany. The students exchanged information about the use of nuclear and conventional power sources in their countries, then went on to share their feelings about such topics as sports, food, fashion, music, and peer pressure.

Talking to Each Other
Because the three participating Massachusetts schools were located in different communities, they needed their own domestic telecommunications capacity to plan their program and for their joint classroom activities. Fortunately, the University of Lowell College of Education had already developed a fully interactive two-way video network connecting the several university campuses to eight surrounding towns. KITES used this network for its interactive three-town telecast classes on such topics as the relative costs, pollution output, and benefits of alternative power generation techniques. Participating students and teachers made extensive preparations (posters, graphs, and other visual materials) for each of these interactive TV classes, which were enhanced by regular instruction and support from expert faculty at the University's College of Pure and Applied Science.

Thanks also to a university-sponsored electronic computer conferencing system, KITES teachers in the three towns were able to work together on a day-to-day basis to develop their curriculums. This system, called CoSy (Conferencing System), allowed KITES teachers to communicate as a collective group through a dedicated project "conference" and to exchange private electronic mail (e-mail) messages when necessary. The use of CoSy was critical, since regular face-to-face curriculum development meetings and endless games of "telephone tag" would have rendered the project unmanageable.

For international data communication, students, teachers, and project staff used various computer networks (such as C. S. Net—a worldwide network, funded by the National Science Foundation, which links science researchers) to which the University of Lowell, like many other universities, belongs. The university provided network access free of charge, as did the University of Karlsruhe for the Nebenius Realschule. International electronic mail proved indispensable for project management. For KITES teachers and students, the immediacy of contact between the two countries generated much excitement and invaluable content-related communication leading up to the live teleconference.

The participating students used the conventional mail system to share elaborate posters and books about life

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Fig. 1. A Mini-Glossary of Terms

1. **Satellite video teleconferencing**: an event that allows groups of people to communicate directly by television over long distances. Video signals are transmitted by communications satellite.

2. **Electronic mail (E-mail)**: a computerized communications system that permits individuals to exchange private mail messages electronically. The advantage is that messages are posted almost immediately after they are sent.

3. **Computer conferencing**: a computerized communication system that allows groups of individuals to communicate collectively in an open forum.

4. **Uplinking**: the procedure that transmits earthbound video signals to a communications satellite in orbit 22,300 miles above the equator.

5. **Downlinking**: the procedure that receives and transmits video signals from communication satellites to earthbound viewing locations.
in their schools and communities, photographs, local travel brochures, audiocassettes, slides, and videotapes of local sports and cultural events. The importance of regular communication between the two countries before the teleconference cannot be overemphasized. Not only should project and teaching personnel establish comfortable familiarity with one another, students of this age must also develop strong interpersonal ties. Otherwise, at the internationally telecast moment of truth, they will freeze solid, much to the detriment of their self-images (and the wasted time will add to the already high cost of live international satellite transmission).

One interesting pre-teleconference exchange was a "lifestyle survey" developed by the American students on such matters as political views, personal relationships, ethnic backgrounds, and lifestyles. One of the survey questions dealt with perceived peer pressure. Interestingly, 92 percent of the American students claimed that peer pressure seriously influenced their values and behaviors, while only 52 percent of their German counterparts felt the same way. This cultural difference, identified in the weeks of preparation, sparked an animated discussion during the live video event.

**Realizing the Dream**

The teleconference took place at 9:00 a.m. (3:00 p.m. German time). The American students were bused to the television studio at Digital's Educational Services headquarters in Bedford, Massachusetts. Since no equivalent facility existed near the Nebenius Realschule, Digital arranged for the conversion of the school's gymnasium into a temporary studio especially for this event. Digital also contracted for the uplinking and downlinking of video signals on both sides of the Atlantic. Supporting Digital's production effort, VideoStar Connections, a business television provider, worked with PanAmSat, the owner of a relatively new international communications satellite, to carry both "tracks" of the video transmission between the two continents.

Both sides appointed an adult moderator to keep the event moving at the scripted pace. For the Massachusetts group, a prominent Boston TV meteorologist donated his time for the teleconference and for several prior rehearsal sessions. This role was fulfilled in Germany by a science faculty member from a nearby university with extensive experience in German schools.

The teleconference opened with a greeting from the chair of the Massachusetts Board of Education and ended with a farewell by an official from the Baden-Württemberg Ministry of Education. In between, students exchanged information and opinions on such issues as the Chernobyl disaster, American anti-nuclear protests, the relative merits of nonfossil fuels for power generation, rap music, clothes, home life, and fast foods.

**Taking Stock of Our Efforts**

KITES was founded on the vision of supporting curriculum and promoting global awareness through joint access to existing community resources: human, material, and electronic. The adoption of this vision by all participating organizations was the single most important element of the partnership. The allocation of resources and assignment of responsibilities evolved from the vision. Corporations are not funding agencies and are not inclined simply to award grants. Schools seeking corporate support without a willingness to involve the target companies in the solution of a commonly viewed problem will rarely succeed in finding it.

We learned that the roles, responsibilities, and rights of the institutional partners should be defined at the outset, subject to the possibility of midproject revisions. Naturally, the roles of the participating partners should match their expertise. The schools and the University of Lowell were responsible for curriculum design, staff development, and classroom instruction. Digital held the main responsibility for teleconference production, transmission, scripting, and design. Frequent and open consultation was built into the project's daily operation in every possible manner: electronic and conventional.

Digital has calculated that the video teleconferencing costs would exceed $100,000 if purchased on a contracted basis. However, virtually none of this expense was paid in cash. Most technical costs were met either by Digital's resources, the schools, or the University of Lowell. Staffing expenses were generally covered by the voluntary commitment of time by personnel at the various participating organizations.

This first video event taught us some essential elements of successful teleconferencing:

- There must be a well-focused curricular theme that creates a content structure for teleconference discussion.
- Teleconference time must be set aside for the students to explore topics of particular interest to them, such as music and fashion.
- The participating children must be substantially involved in the design and scripting of the live teleconference.
- While a successful video teleconference requires careful scripting, some time should be set aside for a...
While a successful video teleconference requires careful scripting, some time should be set aside for a relaxed, free flow of information between the two sides.

- On-camera adult guidance and moderation is essential. Adults in this role, however, must try to put the students at ease and encourage them to communicate openly, confidently, using clear language.
- It is important to set aside adequate pre-teleconference rehearsal time.
- Students should get to know one another before the live teleconference, using whatever electronic and conventional means are available.

Extending KITES to Other Schools

Our future plans include open public broadcasts of future live teleconferences with 800-number “talk-back” telephone lines, which will allow a much broader range of school participation. We also plan to forge links with other states by developing and disseminating guide material for adaptation in other locations.

To replace some of the cumbersome artifact exchanges that characterized the pre-teleconference phase, KITES is setting up advanced graphic and text file transfer procedures using state-of-the-art, computer-based, multimedia telecommunication protocols. By creating graphics files, for example, and adding various image-scanning devices, virtually any combination of text, database, graphic, and photographic information can be electronically exchanged between nations.

Currently KITES is working to make the Shrewsbury, Massachusetts, public schools the new American partner, and seeking a second public school in an urban setting. Overseas, KITES has established links with two schools in the Soviet Union and is working on contacts with other countries. Digital’s worldwide educational services network will be instrumental in establishing these foreign links, as will the computing facilities of the University of Lowell and the data networking capacities of other private and public organizations. A vigorous fund-raising effort is under way to augment existing resources for curriculum development, teacher support, parent involvement, and program expansion and dissemination.

The students and teachers who participated in the Massachusetts/Germany KITES exchange were delighted with their teleconferencing experience. The American students found new inspiration for their nuclear power research, and the Germans were fascinated with this chance to practice their considerable English skills. The American students, in fact, seemed amazed by the German students’ fluency in English—yet another learning experience afforded by the miracle of technology.

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