GIS Live and Web Problem-Solving
Rita Hagevik, Diana Hales, and Julia Harrell

Abstract

GIS Live is a live, interactive, web problem-solving (WPS) program that partners Geographic Information Systems (GIS) professionals with educators to implement geospatial technologies as learning tools. It is a collaborative effort of many government agencies, educational institutions, and professional organizations. The challenges that problem-based learning affords can engage teachers and students in research, and the use of technology can serve as a vehicle for publishing and presenting projects to real audiences via the Internet as well as through telecommunications. Using these technologies connects schools with partners from around the world.

Description of GIS Live: An Online and Interactive Teleconference

GIS Live is North Carolina's answer to the increasingly important question of how to help educators bring hands-on geography to their students. Harnessing the immense power of the Web, Geographic Information System (GIS) professionals and university researchers team with teachers and their students to share real-world applications of the latest geotechnologies and explore how these tools can be used for interdisciplinary, relevant teaching and learning. GIS Live is an example of the effective application of telecommunications and web-streaming technologies that provide new opportunities for teacher and student learning. In addition, these technologies offer a means of sharing that has helped bridge distances by facilitating world-wide participation.

GIS Live is an interactive event. During the one-day live main event, those watching over the Internet can participate by asking questions via a message board. Additionally, the streaming video is archived so that others can participate in the event at more convenient times or even multiple times. The accompanying website provides information on pre and post conference activities for schools as well as lesson plans for further extensions. Presentation materials and additional activities are linked to the conference program. The GIS Live website has become a resource for teachers and students during its four-year evolution.

GIS Live resulted from a partnership between North Carolina State University’s (NCSU) Department of Math, Science, and Technology Education; the College of Natural Resources; the North Carolina Department of Public Instruction’s Distance Learning Section; and the North Carolina Center for Geographic Information Analysis (NCCGIA). The partnership is supported by many other agencies and professional organizations such as the GIS Departments of Wake County and the Town of Cary, NC Department of Environment and Natural Resources, the State Center for Health Statistics, NC Geodetic Survey, NC Museum of Natural Sciences, and the NC Urban and Regional
Information Systems Association. A steering committee meets monthly to collaborate on the design, evaluation, and theme for the program each year. A series of online communications and smaller teleconferences leads to one larger teleconferencing event which occurs concurrently with the international event GIS Day. In the past, other teleconferences have occurred concurrently with national events such as National Geography Awareness Week or Earth Science Week.

GIS Live is an example of a specific application of distance learning technologies in that it is not centered at one site. Instead, multiple teleconferencing sites are linked with a facilitator at each location. At any one event, as many as 75 people participate at the different sites, focused on one theme or pre-planned activity.

Need for GIS Live

The initiation of GIS Live stemmed from a need to unite the State in a celebration of GIS Day. GIS Day is an international event whose goal is to educate millions of children and adults about geography and to demonstrate GIS technology at schools and organizations around the world. The four premises that have emerged from the North Carolina partnership include:

1. Due to federal school legislation, it is more important than ever that reading and literacy are at the center of learning. In addition, North Carolina will soon reinstitute the testing of science. It is vital that teachers learn to integrate reading and literacy into their teaching of science. Technology, in general, and GIS in particular, are effective for developing literacy-rich interdisciplinary projects.
2. Many teachers are being introduced to GIS and other technologies through staff development institutes. GIS Live is a unifying event that supports these new initiatives and gives teachers and students a means for sharing their new knowledge and projects with others. Teachers can update their knowledge of the latest technologies and ways of applying them to develop interdisciplinary projects.
3. GIS Live is a vehicle for creating and maintaining school, community, and business partnerships as a two-way system of communication and support that takes students out of the classroom and into their local communities and environments to do real and important work.
4. The program provides teachers with ongoing, on-line professional development in the latest technology tools for developing geography-based, interdisciplinary projects.

The Design of GIS Live

Collaboration and interaction are important components of GIS Live, especially when using interactive technologies. According to Spence, Stubbs, and Huber (2000), combinations of technologies support, enhance, reinforce, and motivate learning. Since educational and state agencies were interested in working together to support teachers and students, they brought their own areas of expertise and pledged their financial
support to the project. The committee members, who met once a month via phone and teleconferencing, collaborated and planned the design and implementation of the online conference and development of the Web resource. With interaction and collaboration as goals, committee members of GIS professionals and educators supported teachers and students as they planned to present their interdisciplinary GIS school projects.

Each year, based on input from teachers, a theme for the conference was chosen (see Table 1). Over the years, the theme has become more focused. The first year’s theme was *GIS Partnerships* and the second year’s theme was *Using GIS to Solve Problems*. Year three focused on a problem scenario called *Autumn Breeze: Hurricane Zeus* and year four was called *Open Places, Wild Spaces*.

**Years One and Two**

In years one and two, an eForum for teachers was held after school. The eForum allowed teachers experienced with GIS technologies to share how to create partnerships, design student internships, and obtain funding. Teachers in a college course at the University of Parana in Brazil even presented their projects in the second year.

During these inaugural years, the Team Challenge was developed. The Team Challenge involved students’ conducting the Mapping Our School Site project (MOSS) (Hagevik, 1999) for 3 hours in the butterfly garden at the Capitol. Students and their teachers had conducted this project at their schools so they were demonstrating their expertise at the Capitol site. Naturalists helped with the fieldwork and identification of plants and animals in the 10m² plot. Students gave live reports throughout the day that were broadcast back to the videoconferencing site at the NC Department of Public Instruction’s videoconferencing center and then streamed out to the Web. In the afternoon, they used GIS to analyze their results and create maps which they then presented.

In the first year, four schools of middle and high school students worked together on the MOSS problem-solving project, and in the second year, students from the Saturday Program for Academic and Cultural Education (SPACE) also participated. Additionally, students from Carnage Middle School presented their work on The Tumbleweed Project, a partnership with NCSU and NASA that involved designing a wind-driven sensor device with the goal of discovering life on Mars outside. Students were able to discuss their project with NASA’s Jet Propulsion Lab in Pasadena, CA, to explain how navigation works in outerspace. The two-way teleconferencing was so successful that the GIS Live event became a multi-teleconferencing event in years three and four.

**Years Three and Four**

In year three, a pre-conference teleconference and webcast were held for schools to demonstrate problem-solving, GIS, and literacy integration in science instead of the
EForum. During the pre-conference, the Charlotte-Mecklenburg team described Summer Breeze, a highly successful emergency response scenario and introduced Autumn Breeze, a role-play of how emergency response teams in their communities might respond to the threat of a category three hurricane. This helped schools practice connecting to the event as they discussed their participation in the problem scenario. In year four, members of the steering committee traveled to schools to assist them with implementation of problem-solving and GPS into their classes. A video was created of their projects, which was aired during GIS Live. While at the schools, questions were answered regarding connecting, participating, and interacting during the live event. In these years, as a result of requests from teachers, GIS careers were added to the program. By this time, several students had received internships due to their new technology expertise.

All presentations each year at the conference focused on problem-solving and partnerships. For example, a teacher and her students presented their disease transmission detective project that they had done with a regional geographer from the USDA. Middle grade student interns who had partnered with the NC Climate Center presented meteorology projects that investigated student-generated climate questions. The committee paired teachers with local community agencies, including those out of state, as was the case with a teacher who had moved to Columbus, GA. Each year the GIS Live website expanded to include resources for teachers and students. A virtual field trip provided a scavenger hunt focused around events; pre and post lessons for each presentation along with additional pre and post activities allowed teachers to use the on-line conference as a virtual field trip; and many teachers contributed lessons, ideas, and activities to this growing web resource.
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<td></td>
<td>10 strands: Health, Critical Incident Response, Crime Analysis, research (remote sensing and wildlife habitat modeling), Coastal Management, Urban Planning, Meteorology and Snow Command, Urban Ecological Analyses, and Marine Science</td>
<td>11 strands: Disease Detectives (epidemiology), GIS Careers, School Transportation, NC OneMap, The Tumbleweed Project, Navigating to Mars; Meteorology; Urban Ecosystem Analyses; Crime Analysis; Redistricting and Campaign Planning, Environmental Justice</td>
<td>6 strands: Introduction to GIS and GPS; Autumn Breeze: Hurricane Zeus Scenario; Climate Change, Environmental Health; 4-H Club's GIS Project; Bennett's Mill Pond Project; GIS Careers, 3-D Visualization (Raleigh)</td>
<td>8 strands: Introduction to GIS and GPS; Using Conservation Data; Finding Open Lands, Geocaching; GIS careers, 4-H and Historical mapping, NC Invasive Species, Tracking Tundra Swans &amp; Pintail Ducks</td>
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<td>Highlights</td>
<td>GIS Live Team Challenge -- MOSS Field Demo by middle grades and high school students and their teachers</td>
<td>Presentation on GIS and Meteorology by WRAL; Mars Rover Exploration by Project Navigator and Manager, from JPL in CA; GIS Live Team Challenge (MOSS) by SPACE students</td>
<td>Autumn Breeze: Hurricane Zeus Scenario (Collaboration with Mecklenburg County, Holmes High School, &amp; Columbus, GA)</td>
<td>GIS Live Team Challenge-- GPS and Geocaching</td>
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<td>Participants</td>
<td>Participants from 3 countries (US, Canada, and India); 26 states registered</td>
<td>35 sustained streams reported; completed evals from -- NC, TN., AK, SC, and Barranquilla, Columbia; participation of 208 students reported.</td>
<td>5 videoconference sites: DPI, Raleigh; Mecklenburg County Health Dept., Charlotte; NC A&amp;T, Greensboro; Holmes HS, Edenton; East Columbus Magnet, Columbus, GA; roughly 55 sustained streams during the day</td>
<td>3 videoconference sites: NC Museum of Natural Sciences, NCA&amp;T, Holmes HS; roughly 40 streams during the day</td>
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<td>Professional Development</td>
<td>eForum for educators from 3 to 5 pm (Presenters included Brazilians from University of Parana.)</td>
<td>eForum for educators from 3 to 5 pm</td>
<td>eForum held in October to help teachers prepare for the event</td>
<td>eForum not held but individual school visits and production of videotape aired during event on using GPS in the classroom</td>
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Web Problem-Solving (WPS) Inquiry

As GIS evolved, presenters become more effective at implementing the problem-solving framework in their projects and in using the framework to share their projects with others. The steps include explaining the problem, the reasons for the problem, the potential outcomes of a variety of solutions to the problems, and the process of choosing the best solution to the problem (Stubbs, Devine, & Hagevik, 2002; Stubbs, DuBay, Anderson, Devine, & Hagevik, 1999; Swartz, 1996). A good example of this was the 2004 Hurricane Zeus problem scenario. The scenario begins that the National Weather Service has issued a hurricane warning in North Carolina:

Hurricane Zeus, a very late season storm is off the coast of the Bahamas and is expected to come ashore as a Category 3 hurricane. The hurricane has wobbled in a loop in the Atlantic Ocean and is expected to make landfall in about 72 hours. The current size of the storm is 200 miles across with sustained winds around the eye of 110 miles per hour. It may pack rains of 4 to 10 inches as the storm moves through the area. We don’t know whether its direct path will hit Wilmington, the Outer Banks or Charlotte. What could be the possible problems in your area if Hurricane Zeus comes your way? Think of how NC OneMap and GIS can help your community prepare for the storm and to solve problems that might arise as a result of its aftermath.

Teachers and students then shared their solutions via teleconferencing and the Web. They created maps, skits, interviews, and stories, which can be viewed through the archived video on the GIS Live website (http://www.ncsu.edu/scilink/gislive04/information.html).

Assessment of GIS Live

Each year after the GIS Live event, a series of at least two meetings were held in which the committee, the GIS professional community, and teachers were asked to critique the event and offer suggestions for the next year. GIS Live is designed to introduce three concepts: 1) the integration of reading and literacy into the teaching of science; 2) the use of technology, particularly GIS, in teaching and learning; and 3) the use of web problem-solving inquiry. Electronic surveys were sent to past participants to evaluate each year’s event. In addition, message board interactions and e-mail messages were evaluated. A select number of teachers and students who participated were interviewed. A report of outcomes, suggestions, and changes was presented each year to the NC Geographic Information Coordinating Council in the spring.

GIS Live allows educators and the public access to the most qualified GIS professionals, scientists, and researchers on the themes of the event. In addition, environmental education professionals from organizations such as the zoo, museums, and environmental centers are able to share information about their programs and
organizations. For example, American Forests (2007) shared their program, the School Environmental Education Program, that provides professional development, software, curriculum, support, partnerships, and continued technical assistance. Teachers and students demonstrated their problem-solving projects that resulted from the program. Through telecommunications and the message board for those interacting via the Web, teachers, students, and the public were able to interact and ask questions of the presenters.

The multi-access format of GIS Live makes it difficult to document everyone who has attended over the past four years. Data indicate that at least 20 school systems and 9 college and universities as well as other non-profit educational agencies or consortia such as Massachusetts Marine Educators, Environmental and Spatial Technologies (EAST) Education Initiative, the Southeast Center for Ocean Science Education Excellence (SECOSEE), and the Ohio Aerospace Institute have attended. Many of these agencies have helped to publicize the event each year to educators, schools, and the public. In addition, the public is invited to be a part of the event at the teleconferencing sites.

The most positive comments from teachers and students came from those that participated in the Team Challenge and Autumn Breeze: The Hurricane Zeus problem-solving scenario. It appears that the greater the interactivity, the more the students and teachers enjoyed the project. Some selected comments from teachers and students follow.

_The kids enjoyed it so much – the whole school watched and it seems like a different school. My classes seem to have a new confidence and other kids are looking forward to being a part of something like GIS Live. The atmosphere is changing – it is a bit hard to describe but nearly all of the kids, even those who just watched are much more interested in learning. No longer do they come in and just want to socialize. I know it sounds hokey but they have been telling other people about how much they are learning and how fun it is. I hope this lasts._ (November 17, 2004; a teacher from Columbus, GA who participated in Autumn Breeze)

_Using GIS has showed me how to take science outside and relate it to the local environment. It has shown me how to integrate technology into the science curriculum in a new and better way._ (November 20, 2002; a participating MOSS teacher)

_GIS should be a core subject._ (November 19, 2003; a SPACE student who participated in the Team Challenge)

_We have moss on the trees and a lot of cool things. I realized that everything is linked together. Our animals need homes just like us. Observing in one spot_
helped me look better. (November 15, 2005; a student participating in the 2005 GPS Team Challenge)

Interestingly, the most positive comments from the web participants were from those who wanted to join next year’s event or were interested in using our model to create their own online conferences. In general, these participants asked how to learn more about GIS as a teaching and learning tool, how to network with colleagues that are using GIS, and ways to learn more about resources and grant opportunities. Some selected comments from those who viewed via the Internet include:

Thank you for the wonderful experience. We have had all our teachers and some high school students present at one time or another during the day and for us in Barranquilla, Colombia; it is a great opportunity to explore these learning opportunities. Please let us know when you have other conferences and if we can participate via videoconferencing with you too. (email communication, November 19, 2003; the participating school in Columbia)

Will these sessions be archived somewhere? They were wonderful…Would love to try some similar activities here…But I need to see/hear them again to catch the “how to’s”! Thanks again for the tremendous amount of effort and education that occurred today. (email communication, November 19, 2003; a participant in Georgia)

If anything the online conference gave the students an opportunity to learn about GIS and to realize engineers can create some important tools that have a positive impact on their own lives though GIS. (email communication, November 19, 2003; an engineering professor).

I really enjoyed watching our students represent John A. Holmes so very well over the NCIH on GIS Live day, November 17. They did an outstanding job with the Hurricane Zeus project and the Millpond Project. I learned so much during the short time I was able to attend the broadcast. It was also an honor to know that Chowan County was a “premier” county in this project. It was also wonderful to see us able to broadcast to and be able to receive a broadcast from Columbus, Georgia. (November 17, 2004; an excerpt the Technology Director from Edenton-Chowan County)

The return rate for post conference surveys was low, approximately 20%, compared to our pre-conference registration. This is not unusual for online surveys (Ilieva, Baron, & Healey, 2002). E-mail correspondence, the message board, meetings, and
interviews became essential in the assessment, review, and revision process. In addition, the archived video, lessons, and other products used during the presentations were employed to evaluate and modify the event from year to year.

Creating an Interactive Communication Environment

We discovered that creativity was the key to a successful interactive communication environment. Just using the instant message board and encouraging questions from the web audience proved inadequate in the first year’s event. Instead, we began using “focus questions” which we directed to the audience before each presentation. We returned to these questions at the end of the presentations to begin the conversations. The host moderated the questions and then summarized the responses, feeding them back to the group for comments. This facilitated the discussion between the on-site audience and the web audience. Each teleconferencing site had a moderator, but the questions from the message board were hosted from one of the sites. This was predetermined before the event. To further encourage web audience participation, we gave prizes throughout the day for answers to questions from previous presentations. The fourth year, we conducted an aerial photo hunt of mystery locations throughout the day. This proved to be very successful.

Another key to interaction was providing technical support for teachers, schools, and the general public. A technical support number and test link along with trouble shooting tips were provided continually on the website to assist individuals. The process of how to access the GIS Live webcast was reviewed throughout the event. Families enjoyed watching their relatives present “live” from wherever they happened to be. One student’s father was able to watch him present from Iraq.

The greatest amount of interaction of the four events was during the Autumn Breeze: Hurricane Zeus Scenario when students were able to compare their communities to each other based on a common problem scenario. As the schools and students presented from different teleconferencing sites, they thought about how their communities were similar and different. Other students from diverse geographical locations compared their communities to the ones being presented. For example, one student wanted to know why hurricanes rarely made landfall in Georgia. The answer came from another student in a different state who had looked it up on the Internet!

Summary and Conclusions

Over time, not only did the number of strands in the conference program decrease and the number of teleconferencing sites increase, but the website and its design became a unifying and supportive framework for the ongoing event. An entry page to the website was added, which on the day of the event has a direct link to the webcast. The GIS Live preview section of the site explains the parts of the program: presentations/partnerships, team challenge, and pre and post activities and lesson plans. The eForum and Team Challenge have been combined with a focus on teacher
professional development. A separate menu button was added for archiving past GIS Live events. The archives contain past programs, associated presentation materials, and the archived streaming video. In the beginning we linked the archived streaming video to each presenter on the conference program page. This quickly became impractical. Now the video files are stored in one continuous stream that is hosted by ITS video service, NCIH. The on-demand content is viewable 24 hours a day and can be paused, stopped, and fast-forwarded during playback. An email from an educator in New Zealand wrote, “The 16-hour time difference and winter exams made participation difficult for us but it was wonderful to be able to sample some of the archived sessions.”

The conference program page has evolved from a schedule to an interactive resource. Last year’s photographs, program, and speaker information are linked to this page. A description and activities were added so that those attending the online conference could prepare for each presentation. In addition, after the event, a link was created to the lesson plans, PowerPoint presentations, and other resources such as software and directions to the conference program. In the educator’s section of the website, activities were added according to experience-level for teachers. Teachers share their favorite related lesson plans in this section. This evolved design of the website has become an important support system for the ongoing event.

Using a problem-solving and project-based focus for design of all the learning activities associated with GIS Live proved to be an important component that continued for the four years of events. The problem-solving framework was communicated and described to presenters and teachers. In year three, during the pre-conference, a demonstration was done on how to incorporate problem-solving into teaching and learning. The investigations and sharing of information in the Team Challenges used the problem-solving framework. By asking questions those participating in the event were included in the presentations. Questioning and inquiry, rather than the dissemination of information, became a goal.

Another goal, creating partnerships, became the cohesive glue that held GIS Live together. In the first two years, groups of partners presented on different strands around a unifying theme. Partnerships included a GIS professional and/or a scientist, a teacher, and students. The eForum was held as a separate event after school. But in years three and four, larger partnerships were formed that continued through multiple presentations. The eForum became a part of the event during the day. For example, the presentations in year three were about climate change, focused on a hypothetical problem scenario that was based on an actual “practice” event. In year four, the problem of open space in the state was addressed throughout the day, including during the Team Challenge. Another result of partnerships has been that students have become interns in various state and local agencies. Educators requested that those professionals presenting discuss their careers and possible internship opportunities for students. As a result, in years three and four, a GIS career presentation was added in which partners and their student interns shared their experiences. It is evident that without these strong and diverse partnerships, GIS Live would not be possible.
An unexpected outcome has been that by connecting to other international events and national organizations that provide related programs, our events have been publicized and supported. During the live webcasts, these organizations have continually aired the events in their school libraries, office lobbies, at their own face-to-face events, and in their museums. The focus on partnerships has created a pool of individuals and organizations that are truly interested in supporting teachers in these innovative projects. Teachers have volunteered to become a part of these events, excited by the possibility of providing such a diverse and unique experience for their students.

Through conducting GIS Live, it has become evident that certain factors are essential when using telecommunication technologies and webcasting. It is important to continually question, who wants to know and how can we create an intensely interactive environment with the fewest number of barriers? For example, in year three teachers and students were prepared for the event through a pre-teleconference, and in year four we visited teachers and students in their schools, conducting GPS activities which we videotaped and aired on the day of the event. The goal has become to strive to use technology in an effort to support learning throughout the year instead of being centered on a one day event. GIS Live has become more than a learning event—it is a journey and an experience of growth.

There are many questions that could be further investigated as a result of four years of implementation using interactive technologies in teaching and learning. Are there other technologies such as podcasting or mobile GIS or others that could support continuous learning? How can evaluation be improved and are there other impacts that we are not measuring? How can more support be offered to teachers, schools, and other groups that would like to incorporate geospatial technologies into learning? How can problem-based, literacy-rich, interdisciplinary projects be better conducted?

Those who have participated in GIS Live are convinced that this method of teaching and learning has great potential and tremendous future impact for education. To conclude, the following tips for success are offered:

**Tips for Success**

1. Use t-shirts to promote the event. During the first event, we hung banners in the teleconferencing room and outside. These banners proved to be very distracting to the audience. A better idea was to have t-shirts for everyone who was presenting at the event. We gave them the t-shirts when they arrived and the speakers put them on over their clothes. We mailed t-shirts to each teleconferencing site, including Brazil, for the students and teacher to wear. To facilitate communication, large-print nametags were worn by everyone involved at the event.

2. Have a host or moderator at each teleconferencing site who is responsible for guiding the event. In GIS Live, the outside environment was included as a location and had its own host. All hosts had a loosely organized script which they followed throughout the day. Hosts were instructed on ways to best interact with the videoconferencing sites and the web audience. It was important that the hosts use
wait-time and direct questions to different teleconferencing sites. For example, “NC A&T, do you have any questions for the speaker?”

3. Use other volunteers to help with specific duties. In addition to the hosts, we used volunteers divided up into teams responsible for different groups during the day. The volunteer teams included those responsible for working with teachers and students, welcoming and registration, refreshments, photography, and answering technical questions. The GIS Live partners provided volunteers for the events.

4. Be sure to include a technical volunteer team, in addition to the technician at the videoconferencing sites. Our technical volunteer team helped the speakers troubleshoot during the day and assisted them with computer-related problems. They made the speakers feel welcome and reviewed important reminders when communicating in a studio setting.

5. Encourage groups to practice in advance. Teacher and student groups practiced their projects and presentations before the GIS Live event. Some of the groups came to the teleconferencing sites to practice and others practiced at their schools. Students usually created a general script and order of presentation. This improved the comfort level of the students when sharing their presentations during the live events.

6. Let the host provide an orientation to the room for those participating in videoconferencing. In our events, instructions were given regarding how and where to speak depending on the placement of the microphones. The furniture in the rooms was arranged in discussion format with tables and chairs in a half circle facing the speaker and the camera. This avoided anyone looking at the back of someone else’s head or faces being blocked from the camera.

7. Add tips for speakers to the website. The general guidelines were reviewed with each speaker before s/he presented by e-mail or phone. If the speaker was using a PowerPoint presentation, these were e-mailed ahead of time and loaded onto one computer at the teleconferencing site. PowerPoint presentations were checked and changed if necessary to ensure that they were in the correct format for webcasting.

8. Use PowerPoint presentations sparingly. It is recommended that the use of PowerPoint presentations be discouraged because it was found that it did not facilitate interaction. When PowerPoint was used, it was usually only a part of the presentation. The better presentation style when using teleconferencing was a skit, play, or outside activity. Maps and pictures worked better under a document camera rather than on a PowerPoint slide. Placing focus questions or other information under the document camera proved to be an effective way, in general, for the host to communicate with the web audience. Make sure that the host has some blank paper and a marker for such communications.

9. Have an audience at the teleconferencing site and encourage speakers to picture hundreds of people in an auditorium when looking at the camera. Seeing the speaker was very important when using telecommunications. Camera close-ups and eye contact helped focus the attention of the viewers. The speakers did not like seeing themselves on TV while they were presenting. However, the audience at the teleconferencing sites did enjoy seeing themselves on TV. Place the TVs so the audience can see themselves but the speaker cannot see him or herself.
10. Remind the host to be inclusive of the participants and to think of both audiences at the same time. The host should try to refer to them by name. For example, “Susan from Oklahoma would like to know………” or “We have questions from four states; let’s see what Kansas would like to know.” If a speaker was unable to answer all of the questions, he or she agreed to answer the questions later through e-mail and/or via the website. An effective way to communicate with the web audience was to use a website throughout the live event. It helped show the web audience where to find the schedule, how to access the site, and how to link to the live webcast.

References


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