

December 1, 2000 • 11 min • Vol. 58 • No. 4

Special Topic / An Antarctic Adventure



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When a teacher joined an exploration team to travel to Antarctica, students throughout the district became scientific explorers, too, with the help of advanced technologies.

Abstract

Would School District 15 be interested in participating in a scientific expedition to Antarctica? When our education colleague Paul Szipiera called with this unexpected question, we unhesitatingly and enthusiastically answered, "Yes!" This unprecedented opportunity responded to one of our district's key goals: to produce world-class learners by building a connected learning community.

So began an extraordinary adventure for our students, our teachers, and our entire school district—an adventure that presented students with new learning opportunities in a dynamic, interactive way that no textbook or lab-based lesson ever could have. The adventure took a School District 15 science teacher from Palatine, Illinois, to the frozen, forbidding continent at the "bottom of the world" as a member of an impressive scientific expedition team that included two former astronauts—James Lovell and Owen Garriott—and one NASA scientist.

The experience was a superb example of how technology can be deployed to intrigue and motivate today's high-expectation students by linking them with real-world experiences, even across vast distances. The principal of the school from which our expedition team member came summed it up neatly. "There is something very special when children learn from someone actually engaged in an adventure," explained Cheryl Quinn of Plum Grove Junior High School. "The exchange between the teacher and our students is exceptional connected learning."

Antarctica 2000: The Expedition

Antarctica 2000, a privately funded expedition to the interior of the Antarctic continent, was inspired and organized by Sipiara, a professor of geology and astronomy at William Rainey Harper College in Palatine, Illinois, and the founder and president of the Planetary Studies Foundation.

The 10-member scientific team included several well-known names, including the two retired astronauts. Lovell guided the Apollo 13 spacecraft safely back to earth after it was disabled by fire in a 1970 flight—the drama depicted in the movie *Apollo 13*. He also flew on two Gemini spacecrafts and Apollo 8, which orbited the moon for the first time. Garriott spent two months aboard Skylab in 1973, setting what was then a record for the length of a space flight. In 1983, he spent 10 days aboard the Spacelab shuttle. Also part of the expedition team was NASA scientist Richard B. Hoover. Fox News reporter Amanda Onion and cameraman Adam Petlin went along to document the trip. Representing School District 15 was Sharon Hooper, a science teacher from Plum Grove Junior High School.

The expedition had three objectives: to discover and collect meteorites, to sample the Antarctic ice for extremophile life-forms (microorganisms that live in very extreme temperatures), and to support distance education and learning through real-world experiments and scientific data exchanges with students in District 15 schools.

The Antarctica 2000 expedition, which took place in early January 2000, was a success. The team collected a significant number of meteorites as well as core samples of Antarctic ice to examine for evidence of extremophile life-forms.

For School District 15, it was also a successful learning and teaching experience. Our students and teachers were connected directly to the expedition through regular communication from Hooper. While she was in Antarctica, she called into the district's broadcast studio daily, using a satellite-linked Iridium telephone, donated by Motorola. From our point of view, the most significant result was the enthusiasm and excitement that the project created among our students, teachers, parents, and community.

Making It Happen

School District 15 has long had a mutually beneficial relationship with the Planetary Studies Foundation. The foundation supported our Discover 15 Space Shuttle program, which includes a "space shuttle" (a converted old school bus) and a simulated mission-control room to provide hands-on science and math learning. The foundation also facilitated the annual visit of a NASA astronaut to our district, as well as student visits to a nearby planetarium on the Harper College campus.

When Siperia decided to include a teacher as a member of the expedition team, he extended the opportunity to School District 15. It was an exciting prospect—to create an unusual learning experience for our 13,000 elementary and junior high students. We could take full advantage of the situation because of our existing technology infrastructure; our district has a fully equipped television studio, which is capable of broadcasting to all of our 19 schools. Every classroom in every school is equipped with a 32-inch color television monitor. This made it possible for all of our students to share in the learning adventure.

We also have a strong base of community support, which provided the financial backing that enabled the district's participation in Antarctica 2000. Our supporters included more than 40 organizations and individuals in the community, including the District Fifteen Educational Foundation, Northrop Grumman, Inc., and Whole Foods, Inc.

Designing the Learning Experience

Our objective was much broader than just sending one teacher to participate in the expedition. We planned to use Antarctica 2000 as a focal point for connected learning in science, math, and geography. Even though our students would be safe (and warm) inside their schools, we wanted them to feel as if they were an important part of the expedition. They had the opportunity to share in real-world science experiments that would parallel the scientific work of the expedition.

Several months before the expedition, a staff team began planning how best to integrate the adventure into our curriculum. Because the primary focus was science, we turned to Nancy Hayes, coordinator of math and science programs for the district. Working with teachers in each school, she identified experiments from the district's science curriculum that could be conducted by students at school, then replicated by Hooper in Antarctica, allowing for a direct comparison of results.

Hayes found videotapes and other materials on Antarctica to give students a more in-depth understanding of conditions on the continent, and, in anticipation of the team's arrival on-site, each participating teacher received packets of related information.

Our technology staff prepared for six days of broadcasting Hooper's daily live call-ins to the schools and taped some pre-expedition video for later use. A staff member served as our broadcast anchor. Our communications staff geared up to handle the anticipated media interest and to produce regular news releases and printed updates, which were distributed throughout the expedition. After extensive and careful preparation, we were ready.

Live . . . from Antarctica

The Antarctica 2000 team left Chicago on January 2, and arrived in Punta Arenas, Chile, on January 4. The following day, clouds and wind over the base camp in Patriot Hills, Antarctica, prevented the team from landing after a six-hour flight from Chile, and they were forced to fly seven more hours to return. Persistent bad weather conditions delayed their arrival to Patriot Hills until January 9. Not only was this delay difficult and frustrating for the expedition team, it was also problematic for the School District 15 team because we had scheduled our first Antarctica broadcast for January 7. Despite that our "star" wasn't yet on location, in true television tradition, the team felt that the broadcast must go on. They successfully scrambled to create a quality instructional substitute for the planned live broadcast.

A last-minute phone call to a well-known television meteorologist, Tom Skilling of Chicago's Channel 9, resulted in his enthusiastic participation in our first broadcast. Because the weather was delaying our plans, we used weather as an object lesson for the first day's broadcast. Skilling called in to our broadcast studio to share his extensive knowledge of weather conditions in Antarctica. Our staff also interviewed Artie the Penguin, a technology staff member wearing a rented penguin costume.

By the next scheduled broadcast on January 10, Hooper called in to the district's television studio, where the signal was broadcast over the audio portion of our channel 44. Simply by turning on the television monitors, classroom teachers could tune in live. Students who wanted to discuss the experiments or to ask questions called the studio on another line. These calls were then played aloud in the studio so Hooper could hear them. A special device in the studio control room allowed incoming student calls to be answered and cued off-air so that as soon as one caller stopped talking, another would be ready to go.

Hooper conferred with students in 11 classrooms, one at a time, while other district students listened in their classrooms. For those who were unable to hear the live broadcast, we taped the calls for a second broadcast later in the day. Along with district broadcasts, students and teachers could use the Internet to access a daily update and other information from Fox News.

Sharing Experiments

Sharon Hooper completed the same experiments as the classroom teachers and students. All experiments were based on the district's current standards-based science curriculum. For example, in 6th grade, students in one area of study focused on the concepts of physical science related to force, motion, friction, and gravity. Students in Beth De Anda's 6th grade class determined what lubricant would have the greatest effect on reducing friction in cold temperatures. A wooden block was attached to a spring scale. This

block was pulled with string across various mediums, such as petroleum jelly, lotion, and cooking oil. When Hooper called to speak with students, they asked for her data. Q: What lubricant worked the best under conditions in Antarctica?A: Lotion.Q: What variables had you not anticipated?A: The extreme wind. We moved the experiment inside the tent, laid plastic down, and then needed a couple of scientists to assist in the experiment, even inside the tent.

Students in Arlene Wada's 4th grade class completed an experiment to determine the common types of rocks found in Palatine versus those found in Antarctica. Students gathered various rock samples, labeled locations of findings, and examined size, color, shape, and other characteristics. During Hooper's call-in, they compared their samples with rock samples found in Antarctica. Q: What types of rocks did you locate in Antarctica?A: Quartz, sandstone, epidote, basalt, mica shist, and rhyolite basalt.Q: How did most of the rocks feel?A: Smooth.Q: Were most of the rocks shiny or dull?A: Dull.

Throughout that week, the broadcasts proceeded almost as scheduled, although every day the studio crew had anxious moments waiting for Hooper's call. The daily broadcasts created an aura of excitement for our students. "I really looked forward to the broadcasts every day," explained Alicia Aguirre, an 8th grader at Winston Campus. "I wanted to see what was happening, to hear about what Ms. Hooper was doing. I don't ever want to go to Antarctica, but it was cool to know somebody who was really there."

By the time the expedition team returned, Hooper and Patty Corwin, who had anchored our broadcasts, were media stars among the students—a testament to how pervasive and persuasive the Antarctica broadcasts had been. Corwin was even asked for her autograph when she visited a school several weeks after the broadcasts were over.

- Racing balloons to determine whether temperature affects thrust;

- Testing several lubricants to see which would be more effective at reducing friction in very cold temperatures;
- Measuring the effect of a variety of insulating materials on heat loss; and
- Testing whether the frequency of a pendulum's swing is changed at different locations.

"The experiments gave our students the opportunity to compare real-world data with their own results," explained Hayes. "They could graph their results, compare them with Ms. Hooper's results, analyze them, and discuss them with her while she was in Antarctica. It was powerful."

One student even used the Antarctica experience as the topic for our state writing assessment. At Lincoln School, a class of 3rd grade bilingual students became heroes to other students when they participated in the live broadcast with Hooper. "It really personalized science for them," commented their teacher. "I was proud of how they used their English skills to ask questions. The district studio taped the broadcast, and students took turns taking the videotape home. Their parents were so excited!"

Our participation also brought a lot of media interest. Local newspapers carried extensive stories throughout the trip, and after the team's return, the expedition was covered by Chicago television news. For the 76 percent of community residents who don't have children in our schools, the attention clearly demonstrated the meaning of a connected learning community. For the parents of our students, the experience allowed them to be more involved in their children's education.

After Hooper and her fellow team members returned from Antarctica, we staged one final Antarctica 2000 broadcast. Hooper came into our broadcast studio for a live—and lively—question-and-answer session. Students, both in the studio and on the telephone, peppered her with inquiries about the adventure—asking about such topics as frostbite, temperatures, snow, and food.

Some Act to Follow!

One additional outcome of the expedition has been an enhanced relationship with the Planetary Studies Foundation—one that we hope will lead to more shared adventures in the future. We're working on plans now to create a museum and learning center dedicated to earth and space science for our students and the community.

Antarctica 2000 was not just a single event, but part of our continuing effort to create a connected learning community. Although we know that our school district may not have frequent opportunities that are this exciting and unusual, the experience taught us how to use our technology resources more effectively to create an engaged learning experience for our students. The planning and implementation skills and the distance-learning techniques will be valuable tools for other teaching experiences, even if they are on a smaller scale.

To implement such a project, schools and districts must connect with organizations, businesses, and colleges in the area. It is also important to collaborate on resources: personnel, materials, and funding. The mission statement of School District 15 is to produce world-class learners by building a connected learning community. In our district, we follow through and believe in our mission.