

THE COMPUTERWORLD HONORS PROGRAM

CASE STUDY



LOCATION:

Utica, New York, United States

YEAR:

2006

STATUS:

Laureate

CATEGORY:

Education and Academia

NOMINATING COMPANY:

Nortel

ORGANIZATION:

Oneida-Herkimer-Madison Board of Cooperative
Education Services

PROJECT NAME:

Implementation of Voice and Multimedia Communications

Summary

The Virtual Neighborhood is the name given to the vision of using collaborative technologies to enhance teaching and learning in the Oneida Herkimer Madison (OHM) BOCES region. Using a converged network of IP telephony and IP video conferencing, streaming media and smart classroom technologies, the project opens walls to bring the outside world into the classroom and share resources among districts.

Introductory Overview

The Virtual Neighborhood project was conceived as a way to overcome some of the problems of isolation, geographic distance, poverty and inadequate resources to provide quality, 21st Century educational opportunities for our students and communities.

This project was designed to:

- 1.share multi-media resources and live lessons through the technology of Internet Protocol (IP) Video Conferencing
- 2.provide infrastructure to support Video-on-Demand, Virtual classroom, Interactive multi-media, Virtual Labs, Virtual Field Trips and sharing of teacher made materials
- 3.provide staff development that includes learning to produce and use elements of e-learning
- 4.provide opportunities to make e-learning available to members of the community
- 5.promote sharing of resources among cooperating communities.

The component districts in the OHM BOCES are in an area that has suffered steady economic and population declines over the past several decades. In the diverse communities that comprise this region, families rely on the school systems not only for basic education, but for technology and Internet access, and indeed for cultural and educational experiences they could not otherwise afford. The schools are the hubs of the communities they serve, filling the gaps that might



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be addressed by other groups in more affluent areas.

Despite these challenges, the component districts have valuable resources that, if shared, can enrich access to information and learning experiences for all of the communities. The thrust of this project was to build the infrastructure required to support innovative and collaborative e-learning opportunities for students, teachers, and administrators in the region.

To accomplish these goals, a planning team composed of representatives from each participating school district, BOCES personnel, and expert consultants worked to define the current and required resources, training needs, and implementation plans. The team also met with potential community partners to determine opportunities for collaboration.

Benefits

The project has several advantages for the region, specifically increased reliability and availability of electronic resources, increased connectivity and productivity, and cost savings.

The Virtual Neighborhood has already made a difference for teachers and students in the region. Barriers of time and distance disappear through the use of videoconferencing. Students have had opportunities to meet and collaborate with their peers in the region and in other parts of the country. They have participated in virtual field trips, providing experiences they would never have had without this technology. Teachers have had staff development workshops via videoconferencing, saving time and travel expenses. A few highlights from the past year include:

- Teachers participated in a videoconference with Ray Bradbury, author of *Fahrenheit 451*.
- High school biology students watched surgeons operating at a hospital in Toledo Ohio and asked questions following the surgery.
- Elementary students had a virtual field trip to the Smithsonian Institution, learning about native Americans through art.
- Students in several grades collaborated with peers throughout the country, sharing literature in the Read Across America program.

Streaming media technology is reducing the need for couriers to deliver media resources and giving teachers the ability to use media selections that best conveys difficult concepts. OHM BOCES has secured licensing that allows districts to share a library of media content over IP. Districts no longer need to maintain their own costly library of videotapes, DVDs and expensive equipment. Teachers can choose either full media elements or snippets on an as-needed basis.

Various types of presentation equipment in the classroom are used to bring these technologies together. Projectors, electronic whiteboards, tablets, and document cameras are used in conjunction with classroom computers and videoconferencing equipment in the development of smart classrooms. The convergence of all of this technology enables teachers to select the best method to convey concepts and engage students in active learning.

Cost savings associated with the IP telephony help districts in an increasingly difficult budgetary time. Districts have saved money on line charges, long distance and toll calls and maintenance by converting hundreds of individual telephone lines to switched IP network systems. The BOCES interconnect provides for both intra-district and inter-district calling.

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The Virtual Neighborhood is still in early stages, but is already making changes in the way teachers and administrators approach their work. Teachers and administrators locally use videoconferencing to conduct meetings, to save time and travel expense. The expertise of an individual is as close as a computer with videoconferencing capabilities. Teachers no longer have to sign up for video materials weeks in advance but can access them from their computers and integrating such resources into lessons is streamlined. Teachers are using virtual field trips to broaden their students' understanding of the world in which they live. Staff development is no longer relegated to full or half-day events but now include regular follow-up in smaller, more effective time intervals.

Converged networks are going to be the highway of the future for distance learning and media delivery in education. These networks will allow teachers to bring the outside world into the classroom and will become an efficient communications tool for administrators as well. Local and global partners will use these networks to enhance collaborations such as mentoring and apprenticeship programs, high school to college bridging opportunities, and continuing graduate education for teachers.

The Importance of Technology

The Nortel converged network solution and enhanced Wide Area Network infrastructure are the keys to this project. Districts worked with the OHM BOCES to upgrade bandwidth within and between buildings and to the BOCES. To provide the requisite quality of service, districts had to upgrade switching equipment to layer 3 switches. IP Telephony and IP Video conferencing using the Nortel Multimedia Communication Server and Polycom Videoconferencing equipment make use of the switched network to provide the high quality video and multimedia collaboration. Desktop software videoconferencing clients and eyeball cameras bring the power of videoconferencing into the office environment for administrators, principals, and guidance counselors. The increased bandwidth and use of caching servers allows districts to make the best use of streaming media. In addition to the well-indexed collections of media available from the BOCES collection, teachers are making use of other resources such as live webcams. The last mile into the classroom is complete with the addition of computers and presentation equipment.

Originality

The excitement generated when students can see and talk with experts in remote locations or visit cultural venues such as the Smithsonian Institution is contagious and far-reaching. Teachers who can complete a Master's degree in Library Science without traveling four hours each way to attend class are singing the praises of the technology. Administrators from the remote areas of the region can attend regional meetings without leaving their buildings. Individual library collections are increased dramatically with the sharing of a regional media library available through the network. Teachers and students can bring together disparate sources of information and share within the classroom or with other classes and schools.

While other schools and districts have been experimenting with some of the applications used in this project, the Virtual Neighborhood brings together all of the collaborative technologies in a comprehensive way to a large constituency. The Virtual Neighborhood is the first of its kind to integrate IP telephony, IP videoconferencing, streaming media, and smart classrooms on such a



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wide scale.

Success

Twelve districts in Oneida county, joined by twelve more in Herkimer county are served by the OHM BOCES. These 24 districts serve over 40,000 students and 3600 teachers in an area of 1800 square miles. While not all are currently engaged in the virtual neighborhood, this is an example of the potential that this project can reach.

As mentioned before, use of the collaboration technologies reaches students, teachers and administrators in different ways. Administrators see a return on investment both educationally and financially as teaching and learning, staff development and organizational management are affected. Just one example of how the IP videoconferencing was used to expose primary students to new experiences is given below.

December 7th was a cold, blustery day with snow piling up fast outside the Elementary Library windows. Inside, however, three classes of 1st grade students stayed warm and cozy while they took a "virtual field trip" to the Indianapolis Zoo. Without having to board a bus, or put on a coat we visited across the Internet by using our Polycom unit. We called the zoo on our Polycom and when they answered at the zoo, they could see us, and we could see them on the large screen TV and the pull down screen at the front of the room. Our students were treated to a special reading of the classic Jan Brett book, *The Mitten*. Afterwards, they were able to meet some of the real animals at the zoo that were mentioned in the book. More than just seeing the animals, the students were able to interact with the zoo personnel by asking and answering questions. Our teachers were impressed with the amount of material the presenter was able to pack into the hour long presentation. We all agreed it was a great adventure for both the students and the staff. -Janet Dietz, Oriskany Elementary School, December 2005

Teachers in three school districts involved in a collaborative Learning Technologies Grant were able to benefit from the expertise of a specialist in peer coaching from out of state by videoconferencing, without having to pay travel costs usually associated with such events. During the course of the grant, meetings and workshops with the two groups of teachers are conducted via videoconferencing. Teachers in one district used the Polycom to show their colleagues in the neighboring district how electronic whiteboards can be used to enhance English Language Arts across the curriculum.

Most of the Oneida County districts served by the BOCES have joined the telephone interconnect and media services, making use of the cost savings through those collaborations. Many are now installing caching servers to enhance the efficiency of the streaming media. One of the districts converted all of the classrooms in the high school to smart classrooms with interactive presentation equipment including computers, document cameras, plasma displays and wireless tablets. Others are focusing on media streaming or video conferencing. As they learn and grow with the technologies, they share successes and problem solving with each other. Districts in neighboring Herkimer County are beginning to join the Virtual Neighborhood. As a result, the neighborhood will grow in density, diversity, and geographic dispersion. Technology is ever changing and the Neighborhood will use the technology already available while exploring new options to build on this firm foundation.

As with all innovations, acceptance varies among and within the districts. There are the early

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adopters anxious to try any new technology, the majority who will wait to be shown the way, and the late adopters who need coaxing or reassurance that the changes they make will be worth the effort. Even so, use of videoconferencing is growing exponentially in the area. Schools and districts with multiple units are using them in innovative ways while others are making plans to increase the technology. For example, the largest district in the area, with 12 buildings, currently has one Polycom unit but has budgeted to purchase one for each building. On the other hand, a smaller district has two in the secondary school and one in the elementary school and is exploring use of videoconferencing to have classes collaborate within and between buildings.

The Virtual Neighborhood is still in the early stages and growing in amount and variety of applications. While the major use now is in lesson activities in the classroom and some professional development and administrative meetings, we hope to expand the use of video streaming and distribution. Teachers are talking about using the videoconferencing to promote peer review and mentoring, where classes can be observed remotely. One advantage of such an approach is that the students soon learn to ignore the technology, which then becomes transparent, resulting in a more authentic experience. Exemplary lessons or inservice workshops can be captured and reviewed and redistributed. Access and use with community partners is just beginning. The team is evaluating additional technology such as the Nortel MCS 5100 multimedia server and converged desktop for video distribution over the network. The Virtual Neighborhood, like most neighborhoods, is not a static entity, but will mature and grow over time.

Difficulty

To pull together a multifaceted project such as this has required and continues to require considerable planning. The first step is organizational, bringing together the leadership and technical expertise. Over a period of time, district leaders were introduced to the concepts and potential of the collaborative technologies. Demonstrations and pilot applications allowed district and school leaders and teachers to explore videoconferencing and media streaming.

With a planning grant from the FCC Public Telecommunications Facilities Program, OHM BOCES hired consultants to evaluate the district and regional infrastructure and staff development needs. A team of representatives from each district worked with the consultants to develop and implement the studies. Final reports presented to the district leadership help each district develop plans to address shortcomings in technology, infrastructure, or skills and curriculum integration.

As is common with most technology projects, budgetary constraints are a concern in the Virtual Neighborhood. Financial officers and other administrators were quick to see the advantages to the telephone interconnect, but the other technologies were a little harder to sell. Return on investment in education is harder to show and more than simply cost effectiveness or increased productivity. By showing that the investment required for infrastructure upgrades would support the entire suite of applications, the team was able to parlay interest in one area or another to support the project.

At all levels, individuals considering adoption of the collaborative technologies ask,

“What is this technology?”

“How will it affect me?”



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“How will it benefit students?”

“Can we afford this?”

“Why do we need this?”

By providing technical and instructional support and opportunities to demonstrate or observe the technology in use, OHM BOCES has helped teachers and administrators to overcome fears and concerns and choose the best starting point to join the Virtual Neighborhood. The effect is a spiraling increase in the use of the technology to promote not only the new technologies, but more importantly, best practices for education in the 21st Century.