

## *Seeing is believing: the role of videoconferencing in distance learning*

### **Marie Martin**

*Formerly a teacher of Modern Languages and International Officer of the Western Education & Library Board (WELB) in Northern Ireland, Marie Martin is currently an education consultant, specialising in distance learning. As adjunct faculty for Carlow University, Pittsburgh, PA, she is currently delivering a distance learning course for undergraduate and graduate students, using a blend of computer-conferencing and videoconferencing. She has published "Videoconferencing in Teaching and Learning—Case Studies and Guidelines" (WELB, 2000). She has presented on videoconferencing at education conferences in Europe and the USA. Address for correspondence: Marie Martin, C2k Western Centre, Tyrone and Fermanagh Building, 1 Donaghane Road, Omagh, Co. Tyrone BT79 ONS. Email: mmartin@martech.org.uk*

#### **Abstract**

The potential of videoconferencing to enrich distance learning needs to be widely recognised as well as the technology embedded in curriculum delivery and in distance learning programmes. The argument is supported by reference to a wide range of case studies from the author's experiences over a period of six years as International Officer with the Western Education and Library Board in Northern Ireland, and to exemplars of good practice from other sources in different parts of the world. As videoconferencing becomes more widely available in schools and in public libraries, it is important that there is a new awareness of its vast potential in order to ensure that this technology is fully exploited for the benefit of learning communities.

#### **Introduction**

"Good morning, America. Good afternoon, Northern Ireland. Here I am, seeing and talking to students in two different continents at the same time. I didn't even know that was possible, but seeing is believing." The speaker was US Congressman, Jim Walsh. The year was 1996. The event was a videoconference linking the American politician in his office on Capitol Hill with students from schools in New Jersey and County Tyrone, Northern Ireland.

This videoconference was one of many which I conducted between schools in the area of the Western Education and Library Board (WELB), Northern Ireland and experts and institutions in various parts of the world between 1996 and 2002. These exploratory initiatives convinced me of the enormous potential of videoconferencing to enrich dis-

tance learning. The purpose of this paper is to share some of those experiences, together with those of educators in other parts of the world, in order to demonstrate what has already been achieved and to help point the way towards integrating videoconferencing into curriculum delivery and into any form of distance learning.

In this context, distance learning is understood as learning that takes place when a teacher and student(s) are separated by physical distance, and technology is used to bridge the instructional gap (Willis, 1993). Moore (1992) sees this distance as psychological as well as physical and points to the need for this 'transactional distance' to be bridged. My argument is that videoconferencing technology not only bridges this gap, but, by bringing teacher and learners face-to-face virtually in real time, also enriches the distant learning process "in ways that cannot easily be achieved by other means" (Arnold *et al*, 2002, p. 6). Videoconferencing can be used to cater for a range of intelligences and learning styles. The importance of this cannot be overestimated as it is now accepted that learners learn best when different learning styles are addressed (Gardner, 1983).

### **Videoconferencing case studies in WELB, 1996–2002**

The following case studies illustrate the versatility of videoconferencing across a wide range of curricular areas, age groups, and learning styles. The studies also demonstrate that collaborative work in education via videoconferencing at both local and international level is a strikingly effective form of distance learning.

#### *A-Level Politics*

The videoconference linking Capitol Hill with schools in the USA and in Northern Ireland (NI) in 1996 was part of an ambitious and very successful series of virtual visits and field trips (Martin, 2000). The success was due in large measure to the fact that the technology was so user-friendly and that each conference was well prepared, implemented, and followed up.

The aims of this videoconference were twofold: to enrich the taught curriculum by putting students and teachers in virtual face-to-face contact in real time with a remote expert and to foster collaborative learning at international level by connecting them simultaneously with their peers on the other side of the Atlantic. For visual and interpersonal learners, this virtual meeting "brought politics to life." The Northern Irish students were enthused by the opportunity to see and interact with an eminent US politician without moving too far from their own doorstep (Martin, 2000). They had taken the option of the American Constitution in their A-Level Politics course. Congressman Walsh responded to the questions in this area. Dr Arthur Aughey from the University of Ulster, an expert on British politics and on the Northern Ireland situation, dealt with questions from the US students and discussed similarities and differences with Congressman Walsh for the benefit of all participants. The students were also able to interact with one another at appropriate stages in the videoconference.

For 90 minutes, through the process of listening, reflecting, questioning, and discussing, the Irish and American students were fully engaged in active, collaborative learning. They honed their linguistic and logical skills as they shared their understanding of the issues raised, sought clarification where necessary either from the experts or their peers, challenged misperceptions, analysed and evaluated responses. The videoconference was described by a New Jersey teacher as “a mind expanding experience” and by an Irish teacher as having brought “a hitherto undreamed of dimension” to the study of politics (Martin, 2000). A copy of the videotape of the virtual meeting was given to each participating school and proved a valuable learning resource.

#### *A-Level Geography*

A-Level Geography students from a small grammar school in NI received distance lessons from the Liberty Science Center in New Jersey. The first of these, which focused on ecosystems in rivers and estuaries, began with a virtual trip along the Hudson River. The remote teacher pointed out and commented on important features, bringing them into camera close-up as required and taking questions from the alert and stimulated students. This was followed by a highly interactive indoor lesson on coastal erosion, which was further enlivened by virtually working on a model of the Hudson River estuary. The students also made presentations of their work using the document camera. Worksheets, which had been sent in advance as email attachments, were evaluated and follow-up electronic activities were planned.

The “outdoor” part of this extremely varied virtual lesson catered mainly for visual learners. During the “indoor” session the kinaesthetic element was also strong with the students working on the model of the estuary and in the presentation of their own work using the document camera. In her evaluation, the teacher highlighted a number of other benefits: access to primary sources of information which otherwise would not have been possible, enhanced pupil motivation, improved problem solving skills, and a meaningful use of information technology skills. She also found that these sessions had contributed significantly to her professional development by adding to her own knowledge base and by heightening her awareness of the enrichment gained by integrating technology into the curriculum. She was able to use this knowledge and this new approach for her teaching in Key Stages (KS) 3 and 4.

#### *The virtual shared classroom*

The Virtual Shared Classroom project involved KS3 students from two postprimary schools with students from two middle schools in New Jersey. The project, which was conducted mainly by videoconference, gave all participants the experience of collaborative learning, of becoming part of a larger community of learners, and of having a meaningful and beneficial distance learning experience. From the beginning, the focus was on curriculum enrichment. One pair of schools collaborated on a project on the American West; the other two worked together on aspects of the Holocaust. The partners met once a week by videoconference for a period of six weeks. During each shared lesson, the two classes acted as one, dividing into mixed groups of Irish and American pupils. Before each videoconference, they researched their topics on the Internet,

shared their findings, and prepared their presentations by email. This illustrated the potential of videoconferencing to combine with other technologies to support independent learning. The learning experience was further enriched by some team teaching, music, dancing, and drama—the latter appealing greatly to kinaesthetic learners—and by sharing experts who interacted with both sets of students as if they were one class.

### *Special needs*

This case study illustrates how videoconferencing transformed the learning experience of a special needs child in a small island school off the south-west coast of Ireland. The school was part of a network of primary schools which I had been invited to advise on a pilot project on videoconferencing. One of the pupils, a 7-year-old boy, had been diagnosed as having severe learning difficulties. Given the isolation of the school, with sea crossings being dependent on the weather, it had not been possible for the pupil to avail regularly of the specialist support provided through the peripatetic Learning Support Service. At my suggestion, the Learning Support teacher, having had one actual meeting with the pupil—something which I heartily recommend—conducted weekly lessons by videoconference from one of the mainland schools in the network. Great care went into the preparation of, and the follow-up to, each session. A programme of work, suited to the child's individual needs and deliverable by the technology, was drawn up. The school principal sat beside the child during each lesson. Initially, this gave him a feeling of security. It also enabled the principal to provide the essential continuity of support between the sessions.

The immediacy of videoconferencing appealed greatly to the pupil. Obviously an interpersonal and a visual learner, his relationship with the remote teacher strengthened as a result of their weekly virtual face-to-face meetings. Keen to please her, the child worked extremely hard. The support teacher found the technology very use-friendly and mastered it quickly. She also adapted her teaching strategies to the new medium in order to use it to maximum effect for the benefit of her pupil. She reported finding that sections of the lessons were delivered more effectively by videoconference than they would be in a traditional classroom (Martin, 2000). She also reported that she was more focused during a distance lesson by videoconference than in an actual class and that her pupil had fewer distractions. The result was that the child made significant progress. This was noted in a later inspection report.

### *Professional development*

Videoconferencing can also greatly enrich the professional development of teachers. They too can be put into contact with experts and with their peers, either elsewhere in their own country or anywhere else in the world. This leads not only to an enhancement of their continuous learning as professionals, but also to a significant saving of their time and energy. It is also extremely cost-effective. One example is the use of videoconferencing in the Parental Involvement in Numeracy project organised by the WELB in 2000 as part of the NI Numeracy Initiative. The international dimension brought about by videoconferences with Carlow College, a third-level college in Pitts-

burgh, Pennsylvania, helped widen the scope of the project and fired the imagination and enthusiasm of the WELB numeracy team and participating teachers, parents, and pupils. The Head of Mathematics from Carlow College gave presentations on similar projects carried out by the College and on the lessons learned from these. Teachers on both sites shared examples of good practice and arranged to share resources. Parents and pupils exchanged experiences. Use of peripheral technologies, such as the document camera, PowerPoint, and videos, provided a high quality experience. The evaluation highlighted the part played by videoconferencing in enriching the numeracy initiative, widening horizons, and promoting self-esteem in teachers, pupils, and parents.

### **Examples from other places**

In this section, I will select a few examples of good practice from the UK, Ireland and the USA. All demonstrate a growing awareness of the ability of videoconferencing to extend and enrich distance learning across a wide range of curricular areas. Most offer approaches and strategies which are easy to replicate.

#### *The UK*

Within the UK, the pace of videoconferencing activity has begun to increase. Many excellent examples of good practice in schools across a wide range of curricular areas are listed in the Becta website (<http://www.becta.org.uk>).

The Global Leap Project, directed by Mike Griffith, a teacher–adviser working with the Department for Education and Skills on its Videoconferencing in the Classroom project, is helping to raise awareness of the educational value of videoconferencing. The annual one-day Global Leap event enables participating UK schools to “leap” around the globe and participate in a series of lessons via videoconferencing. The purpose of this event is to demonstrate what can actually be done now with videoconferencing and to encourage greater uptake of the technology in the day-to-day life of schools. The Global Leap website (<http://www.global-leap.com>) offers guidance and support to teachers in the use of the technology. It also provides an extensive list of interested schools with videoconferencing capability in many parts of the world and of institutions offering distant lessons via this technology. Griffith has co-authored an invaluable resource book for teachers: *Videoconferencing in the Classroom (2002)*. It gives information, guidance, and case studies detailing models of good practice from Devon and many other parts of the UK, ranging from the Early Years classroom, through cross-phase liaison in Science, to post-16 courses using an external provider.

#### *Ireland*

In Ireland a major project, Dissolving Boundaries through Technology, uses email, computer conferencing, and videoconferencing to promote quality learning and mutual understanding between primary and postprimary schools on both sides of the Irish border. A recent report revealed that at both levels the preferred technology was videoconferencing—56% at primary level and 68% at postprimary. The main reasons were the ability to actually see one another and the immediacy of the medium. This

made discussion easier, improved listening skills, and led to greater tolerance of other perspectives. Sixty per cent also said they found collaborative work more interesting using videoconference. Also highlighted in the report was the extent to which videoconferencing improved communication skills. (Austin *et al*, 2003, pp. 61, 77, 79). These findings have implications for citizenship education which are currently being explored.

### *The USA*

From the numerous examples of good practice in the USA, I have selected two of which I have some personal knowledge—the work being done in the Center for Occupational Research and Development (CORD) in Waco, Texas and the Academy of Cyber Experiences (ACE) Project (<http://www.iu5.org/imts/DLE/ace.htm>) in north-western Pennsylvania.

The Center for Occupational Research and Development is a non-profit organisation dedicated to education reform. It actively promotes videoconferencing as a beneficial agent of change in distance education. The CORD Virtual Teaching Center is engaged in ongoing research on effective teaching strategies and delivery appropriate for this type of virtual instruction. It also holds workshops—both real and virtual—to train teachers in the use and effective application of this technology. It researches the application of videoconferencing in schools throughout the USA. Its publication *Exemplary Applications of Videoconferencing in Education* (Bilton-Ward and Young, 1998) offers examples from 14 different states and covers an impressively wide range of replicable uses of this dynamic technology, including connecting schools and business, linking schools and universities, and exploring careers through virtual field trips.

The Academy of Cyber Experiences was an innovative, carefully structured, and well-funded curriculum and staff development three-year project initiated in northwestern Pennsylvania in the 1997–1998 school year. The project aimed to exploit the potential of videoconferencing as an educational technology and to integrate it into the curriculum. The ACE project provided the necessary infrastructure and technical training for teachers, technical staff, and other end-users in 17 school districts. It also financed the work of 76 teachers in developing model lessons using videoconferencing and the Internet. These are posted on the Internet for the use of other teachers. Project funds also financed a number of vital support structures and strategies, in particular a Distance Learning Committee, which addresses issues relating to the future of videoconferencing in local schools. Ongoing postproject support is provided to schools to promote sustainability and to encourage a wider uptake of videoconferencing as an educational resource by other schools.

### **The downside**

It might be appropriate at this point to look at the potential downside of videoconferencing. The most commonly cited issues in this respect are the difficulty of sustaining the interest of the remote learners, lack of specific training and guidance for teachers, and concerns about the robustness and cost of the technology. Of these, it is perhaps

the risk of “losing” your remote pupils which most fills the novice distant teacher with apprehension. Exclusively teacher-centred methodologies do not transfer easily to the lesson delivered by videoconference. The virtual teacher who is a “talking head” will almost certainly have disinterested remote students, whether these are of school age or are more mature. “Remember the rule: no more than 10–15 minutes of instructor talk without some learner-centred response” [Pacific Bell (<http://www.kn.pacbell.com/wired/vidconf/instruct.html>), 2002]. Other strategies which make for successful and stress-free videoconferencing can be shared in a simple few short training sessions. Guidance can also be obtained from various publications and websites [Arnold *et al.*, 2002; Illinois Video Network (<http://www.state.il.us/cms/ivn/DistanceLearning/Distlearn.htm>), 2003; Martin, 2000; Bilton-Ward, 1997]. None of these strategies is very different from what occurs in a good teacher’s classroom where interactivity, a brisk pace and variety of delivery strategies are the norm and where the level of student interest can be gauged by body language. Videoconferencing is the only technology which allows the distant teacher these vital visual clues.

Generally, however, videoconferencing remains the forgotten technology. In the UK, videoconferencing was not included in the range of technologies in which teachers were trained under the New Opportunities Fund programmes. It would take so little effort to make a huge difference in this respect. “For a small investment (one half to one full day’s training with the technology) a vast improvement in the use of the technology will be seen” (Coventry, n.d.). The real challenge for teachers lies not so much in operating the videoconferencing equipment but in using it to exploit its potential to enhance and enrich teaching and learning. With videoconferencing, as with all other technologies, we should focus “less on the fact that (technology) may be consciously employed to do a task, and come to see the task itself as central, with the technology as substrate” (Bruce & Levin, 1997).

The emphasis in training should be on raising awareness of what is already possible with videoconferencing. Teachers need the opportunity to learn about good practice through accessing actual case studies covering a range of curricular areas. They need the opportunity to dialogue with educators–practitioners in the field. They need workshops to enable them to brainstorm ideas and to release their creativity. Much of this awareness-raising and creative thinking could actually be done by videoconferencing, saving time and energy and giving the teachers “hands-on” experience of the user-friendly technology. The ACE experience shows that once teachers are convinced of the value of videoconferencing, they readily produce creative and innovative ideas for its application in the classroom. Videoconferencing is merely a teaching and learning tool. It needs creative and imaginative teachers to unlock its potential.

The robustness of the technology is no longer an issue. “[The] technology is already mature—we can videoconference today with people across the world. Any developments will only make this easier” (Arnold *et al.*, 2002, p. 166). Developments in broadband will enable us to videoconference from home and use portable mobile conferencing facilities in almost any location. All systems are becoming relatively inexpen-

sive to purchase and the advent of Internet Protocol (IP) will eliminate call charges. The choice of system will generally be dependent on a school's finances and proposed application of the technology. Like computers, videoconferencing systems range from the sophisticated to the simple, from dedicated systems and incorporated units to videophones and webcams. A simple videophone, augmented by a large monitor, can be effective for whole-class use. Webcams are also worth considering for certain situations. Obviously, the picture and audio quality will be an issue here, but webcams can be an inexpensive way of communicating between very small groups. Webcams would also be of benefit to individual distant students or students who are unable to attend school for a period.

### **Looking to the future**

Even this very limited survey makes clear that much good work is being done in videoconferencing in many places. My experiences and those of others point to the potential of the technology to transform the classroom experience for both teachers and pupils. In the hands of a creative teacher or instructor, willing to follow a few simple guidelines, videoconferencing can provide, in a cost-effective, time-effective, and inclusive way, enriching and enjoyable distance learning experiences to people of all ages and abilities regardless of where they live. It can do this in aspects of any curricular area and at all stages of education. It can address a wide range of intelligences and learning styles. It can "dissolve boundaries" in the mind and externally. It can foster educational collaboration and enhance the experiences of learning communities. It can lead to improved teaching strategies in the classroom. It has even been claimed that "for distance learning applications... [videoconferencing] appears to be as effective as face-to-face contact" (Leask & Pachler, 1999, p. 106). The learning can be further extended by recording the videoconferences and using the videotapes as classroom resources. Videostreaming can also be used to archive recordings, thus enabling more people to benefit via the Internet. (Arnold *et al* 2002, p. 166).

My hope is that, as the concept of technology-facilitated distance learning is increasingly accepted at all stages of education, videoconferencing may gain credence as a valid educational resource. An encouraging sign in Northern Ireland is the plan by the Classroom 2000 Project, which is responsible for the educational technology infrastructure in all schools, to add basic videoconferencing facilities at a later phase of its implementation programme. Videoconferencing facilities are also becoming available in all public libraries as part of the Electronic Libraries for Northern Ireland project and in England under the People's Network project.

Before the technology becomes widely available, however, I feel we should be asking what needs to be done to ensure that videoconferencing becomes an integral part of curriculum delivery and of distance learning programmes. Obviously, there is a great need for academic research in this area. Although some research has been done in Higher Education, there is relatively little at primary and postprimary level. (Coventry, 1998; Heath & Halznagel, 2002). In addition, I would strongly urge the establishment in the immediate future, of a range of initiatives similar to that of the

ACE project in north-western Pennsylvania. These initiatives could build on the work being done, for example, by Global Leap and by local projects in other parts of the UK and Ireland.

As the move to IP accelerates, “always on” videoconferencing is likely to become a reality. If we wish to ensure that the educational benefits of this technology are “always” exploited, we need to make provision now.

## References

- Arnold, T., Cayley, S. & Griffith, M. (2002). *Videoconferencing in the classroom: communications technology across the curriculum*. Devon: Devon Curriculum Services.
- Austin, R., Abbott, L., Mulkeen, A. & Metcalfe, N. (2003). *The global classroom: collaboration and cultural awareness in the north and south of Ireland*. Coleraine: University of Ulster.
- Bilton-Ward, A. C. (1997). *Virtual teaching—an educator’s guide*. Waco, TX: CORD Communications Inc.
- Bilton-Ward, A. C. & Young, M. (1998). *Exemplary applications of videoconferencing in education*. Waco, TX: CORD Communications Inc.
- Bruce, B. C. & Levin, J. A. (1997). Educational Technology: Media for Inquiry, Communication, Construction, and Expression. *Journal of Educational Computing Research* 17, 1, 79–102.
- Coventry, L. (1998). *Video conferencing in higher education*. Edinburgh: Institute for Computer Based Learning, Heriot Watt University.
- Gardner, H. (1983). *Frames of mind: the theory of multiple intelligences*. New York: Basic Books.
- Heath, M. J. & Halznagel, D. (2002, October). *Interactive videoconferencing: a literature review*. Prepared for the K-12 National Symposium for Interactive Videoconferencing Dallas, TX.
- Leask, M. & Pachler, N. (1999). *Learning to teach using ICT in the secondary school*. London: Routledge.
- Martin, M. (2000). *Videoconferencing in teaching and learning—case studies and guidelines*. Omagh, Northern Ireland: Western Education and Library Board.
- Willis, B. (1993). *Distance education: a practical guide*. Englewood Cliffs, NJ: Educational Technology Publications.