

Videoconferencing



Ms. Jones's French class spent most of their Friday lesson in a videoconference with students in a school in France. They have also been sending their French essays to their e-mail pen pals over in the French school, receiving their English ones in return. They plan to hold another videoconference with each other at the end of term to discuss the benefits of online collaboration.

What is Videoconferencing?

Videoconferencing is a term used to describe a system where two or more participants, based in different physical locations, can see and hear each other in real time (i.e., 'live') using special equipment. Videoconferencing offers a range of exciting learning opportunities for schools. It is important, however, to define what schools hope to achieve with videoconferencing, keeping in mind existing or proposed technologies. Videoconferencing sessions that involve participants moving around, demonstrating activities and using dedicated multimedia programs will require a high bandwidth for higher quality audio and video. In contrast, videoconferences that entail little or no movement require lower bandwidth.

The most commonly used videoconferencing system in schools is one based on using computers. With the use of dedicated software programs, participants can send files, share programs and even work on the same document simultaneously during a videoconference session.

A less common videoconferencing system uses videophone equipment. These are all-in-one phones with video display panels and video cameras. The quality of the transmission depends on the bandwidth available to the school. These are usually based on ISDN phone systems.

Possible Educational Uses

Videoconferencing can be used for whole class teaching, individual or group work. It is an excellent medium for collaborative student projects, team teaching and distance learning. It can also help schools to offer specialist educational programmes, support special educational needs and provide opportunities for breaking down student and teacher isolation. The following list highlights possible educational uses:

- Practising languages with native speakers
- Team teaching between two or more locations
- Presenting student and teacher resources
- Communicating with mentors and subject matter experts
- Observing demonstrations in other schools, universities and institutions
- Providing teaching at a distance, e.g., to island schools or to students based at home

There are a number of issues central to the success of both individual and group videoconferencing sessions. Again, management of expectations in initial video-conferences is important. Participants should practice in advance, ensuring that they are speaking clearly

and allowing for slight time delays in sentences reaching their audience. Spending time on preparation, pre-testing and disseminating worksheets to participants in advance usually pays dividends.

It is standard practice for group videoconferences to be moderated (chaired). If at all possible, time should be allocated at the end of the videoconference to summarise sessions and plan follow-up activities. As students develop their skills and confidence these formats may be relaxed.

Technical Considerations

With videoconferencing there are a range of possible data transmission methods and hardware configurations. This has an impact on the quality of the videoconference. The lowest quality involves the use of basic hardware configurations, such as a Web cam that is connected to a PC with a standard DSL or wireless broadband Internet connection. Much higher quality can be achieved if there is high quality dedicated equipment available to improve the video and sound quality or a dedicated connection with the other party/school via one or more ISDN lines.

However, it is vital to manage expectations. Video links and video conferences seen in television studios involve extremely expensive equipment and bandwidth beyond the range of schools. With reasonable bandwidth and relatively inexpensive equipment (less than €100) a school can communicate to others in a perfectly adequate manner.

Computer-based Videoconferencing

To support or run a computer-based videoconference the following equipment is required:

- Monitor (larger than standard is best)
- Client software
- Video camera (or webcam)
- Computer with internet, sound and webcam connections
- Microphone
- Speakers

In an educational context, the most common form of videoconferencing uses free software, inexpensive webcams, microphones and computer speakers. Other options, listed below, use dedicated units costing thousands or tens of thousands of euro. Prior to purchasing of such equipment, a school should carefully consider the level of use such equipment might get.

Desktop units allow participants to communicate with each other via their PCs in conjunction with special hardware and software.

- They are most appropriate for one-to-one or small group use.
- The quality of transmission is inferior to other systems.
- It is a possible solution for in-service training, collaborative student projects and peer mentoring.

Roll-abouts are all-in-one, dedicated mobile packages contained within a cabinet. They include one or two monitors housed on top of the cabinet, a camera, and an audio system with an echo canceller and audio suppresser to combat any sound interference.

- They are more expensive than desktop units.
- The quality is usually better as it normally uses higher bandwidth.

Although desktop units and roll-abouts are popular options, it is worth noting that similar videoconferencing systems can be permanently fixed in a dedicated room where issues such as sound can be more effectively controlled.

Computer Requirements

Good quality video transmission and application sharing is reliant upon a computer with adequate memory, hard disk space and a high quality video card. The minimum recommended computer specifications are as follows:

- AMD Sempron or Intel Pentium CPU
- 512MB RAM
- 17" monitor (or larger)
- Windows XP, Mac OS X, or a recent distribution of Linux or variant.
- High quality video card

Software

To hold an Internet-based videoconference, all the participants need to use software on their respective computers. Listed are a few of the more common free software applications currently in use: Instant Messenger and Microsoft Net for Windows; iChat for Macs and Ekiga for Windows and open source Skype is available for Windows, Mac and open source.

It is also possible to have exchanges between more than two locations - this is known as 'multipoint conferencing' - where three or more locations are involved in a videoconference. Many free programmes support this too.

Purchasing Considerations

When purchasing equipment consideration should be given to the quality of webcam and microphones. Some cameras will offer higher resolution (number of dots of light or pixels making up the picture) or the number of frames per second transmitted. While these may appear to ensure better quality of videoconference, they can in fact put a strain on limited bandwidth currently supplied to Irish schools and lead to a poorer quality video-conference.

The quality of lens in webcams is not always linked to their price so checking online reviews of webcam models prior to purchase is advised.

Webcams with built in microphones: Where multiple participants are involved in a video conference a built-in microphone in a webcam may appear to be a useful purchase, however it is generally only useful if one person is using a system at a time, as there is a difficulty in picking up a clear input signal from multiple participants. Passing a relatively inexpensive shared microphone among participants allows for better voice quality.

When buying more expensive videoconferencing equipment, careful consideration should be given to the intended use, the frequency of use and the cost of the equipment. The list of questions outlined below may offer some useful direction.

- Are there plans to communicate with users on an international level and, if so, is additional hardware or software required?
- Does more than one person need to communicate at one time? If so, what is known as a full duplex system is required.
- Does the system offer features that ensure good quality audio and video transmissions, e.g., noise suppression, echo cancellation and adjustable bandwidth?

Note

Sound quality can be a problem with many systems and you may have to experiment regarding the positioning of speakers to reduce feedback. Similarly, care must be taken to ensure lighting is adequate.

Relevant Web Sites

BECTA: How to use video conferencing effectively in your classroom

http://schools.becta.org.uk/index.php?section=tl&catcode=ss_tl_use_02&rid=5223

Becta is a British agency which provides advice and support to the educational sector in the UK. The link refers to its resources on videoconferencing for schools.

Resources and Information on Videoconferencing

www.trecc.org/education/videoconf.php

The Technology Research, Education, and Commercialization Center (TRECC) is a program of the University of Illinois at Urbana/Champaign. This gives a comprehensive overview of educational use of video-conferencing. Though some links are to quite old sites (e.g. 1998), many contain advice and tips as valid now as when they were first written.

Pedagogy & Videoconferencing

www.vcalberta.ca/community/Pedagogy_Videoconferencing_v2.0_October_2006.ppt

A useful Powerpoint presentation with lists of “dos” and “don’ts”

A Practical Guide to Videoconferencing

http://www.ltscotland.org.uk/Images/guide_videoconferencing_tcm4-188914.pdf

This document gives a full overview of issues relating to setting up and using videoconferencing units. It also contains case studies of how this technology has been used in Scottish schools.

Some Free relevant Software Downloads

Ekiga	www.ekiga.org
Microsoft NetMeeting	http://www.microsoft.com/windows/netmeeting/download
Skype	www.skype.com
Instant Messenger	http://www.aim.com

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