

# Preface

*Videoconferencing for K–12 Classrooms, Second Edition* is for teachers and instructional technology coordinators who are looking for ways to use interactive videoconferencing (IVC) in the classroom to help students meet and exceed today’s rigorous educational standards. We have outlined the benefits IVC can provide in an educational setting, provided an overview of how the technology works and how much it might cost, and presented a planning list of necessary equipment. We have also provided step-by-step directions for integrating IVC into the curriculum and detailed examples of how this technology is currently being employed to achieve core curriculum standards. In addition, you will find numerous vignettes scattered throughout the book chronicling real-life classrooms throughout the world where teachers and students are engaged in educational exchanges via interactive videoconferencing.

A glossary of key terms is provided in Appendix C; words defined in the glossary will appear in bold italics when first used in the text.

# Introduction

## The Virtual Education Explosion

Increasing access to emerging communications technologies has provided, or will soon provide, K-12 classrooms throughout the world with the ability to take advantage of educational resources, cultural partnerships, and expert mentoring once available only to those in close proximity to large research universities and major urban areas. You've heard this teaching or delivery method referred to as *virtual classrooms*, cyber schools, online education, web-based instruction, *interactive videoconferencing (IVC)*, e-learning, distance learning, *distributed learning*, and so forth. For the purpose of this book on interactive videoconferencing for the K-12 classroom, we will refer to the overall contemporary *distance education* movement as *virtual learning*. IVC is one of many emerging virtual learning *modalities*. Our plan is to demonstrate to you, as a K-12 classroom teacher, what videoconferencing is, how you and your students can benefit from this powerful technology, and what you need to know to make the most effective use of it in your classroom today.

To fully appreciate what IVC can do for us today that we have never been able to do before, it's helpful to take a quick look at the history of distance education in the United States and the rapid rise of virtual learning in K-12 schools since the start of the 21st century. Distance education has been around a lot longer than many of the educational technologies that we take for granted today—certainly longer than the personal computer. Distance education, in its broadest sense, is the separation of teacher and learner through time or space, or both.

## A Brief History

Distance education has been around since the first teacher mailed the first correspondence course to a remote student centuries ago. Who knows, perhaps even Socrates sent an essay to Plato asking him to ponder it and respond via messenger. Over time, as communication technologies have become more available, convenient, and instantaneous, distance education programs have incorporated ever more advanced modes of content delivery: radio, television, audiotapes, and interactive computer programs. The current generation of technology-based distance learning programs is the product of centuries of experience and development in distance education.

Over the last quarter century, virtual learning has undergone tremendous changes as delivery options have metamorphosed and the number of students interested and able to tap its potential has exploded. Universities were the first to jump on the virtual learning bandwagon. University correspondence courses were made available to military personnel, citizens living abroad, and people physically unable to attend classes for any reason. Over time, these courses have evolved to include audiotapes, videotapes, TV cable and satellite broadcasts, desktop microcomputers, the *Internet*, and IVC technologies. While the first 20 years of growth was primarily in postsecondary applications, K–12 education has increasingly taken to virtual learning in the last few years, a trend that is likely to drive the next evolutionary cycle in instructional delivery methods. Thanks to technological advances and funding opportunities such as *E-rate*, K–12 educators have joined the growing number of *virtual teachers* and *virtual students* worldwide.

Following is a brief history of the key developmental breakthroughs that have made possible interactive videoconferencing for education:

In 1956, AT&T developed the original picture phone test system. This was the first time voice and video were delivered simultaneously over a single phone line. The interest in developing this technology was driven by Cold War fears and the desire to develop advanced technologies for gathering intelligence, in which *telecommunications* would play a pivotal role.

In 1969, Department of Defense officials began transmitting voice over the ARPANet (Advanced Research Projects Agency Network), the precursor to the Internet.

In 1981, the Annenberg Corporation began the development of television courses, and Public Broadcasting launched the Adult Learning Service. At the same time, colleges and universities began offering satellite courses, many of which became online courses as the Internet became more accessible to the general public. K–12 schools did not generally have access to these technology resources in the early 1980s, but K–12 classroom teachers were beginning to learn how to utilize desktop computers as a teaching and administrative tool, which eventually led to the integration of Internet resources, software applications, and data collection tools into the K–12 environment.

By 1992, electronic conferences were regularly taking place through the use of interactive videoconferencing technology. One example from this period was the Global Electronic Shakespeare Conference held in 1992, where professors, journalists, and dignitaries debated Shakespearean literature and new archival discoveries. This was also the year that K–12 teachers were first introduced to the potential of videoconferencing in the classroom, in the form of an *application* called CUseeME, developed by Tim Dorcey of Cornell University. The camera most frequently used in classrooms for CUseeMe resembled an eyeball and sat on top of the computer monitor. The camera (with a built-in microphone) was connected to the computer and used the computer's *modem* to transmit voice and video via the Internet through a **56K** connection over a regular phone line (or a 128K *ISDN* [Integrated Services Digital Network] digital phone line connection). CUseeMe was relatively easy to use and allowed teachers and students sitting in front of a computer to talk with and see someone located hundreds or thousands of miles away.

## *Chapter 1*



# Equipment and Networks

## Basic Equipment and Costs

You may already have interactive videoconferencing equipment installed in your school or somewhere in your district. You may even be using IVC regularly. Or, you may have seen it and wondered what it is and why it's there. If so, you are not alone. Many educators who have heard about the technology, or have seen the equipment sitting in a corner in the district office, have no idea what it can do and how it can be used in the classroom to support standards-based curricula. That's why we're here. Read on!

For day-to-day assistance, you may have a districtwide technical support structure that allows you to call upon an established help desk for equipment or network problems. You may also, over time, learn how to troubleshoot first- or second-level problems with the equipment. Whatever support structure you have available to you, we recommend posting a troubleshooting guide, visible to all users of your IVC classroom, that includes on-site and off-site phone numbers, pager numbers, and, if possible, alternative phone numbers. It may also be helpful to post what the user should not do in the event of an emergency.

## Useful Tips for IVC Classroom Configuration

Included below are additional items to consider adding to your shopping list as you design and equip your IVC classroom. We've also provided a few tips to help you establish a functional system and create a facility that will be user-friendly for everyone.

1. Install an outside phone line with long-distance connectivity so that your remote partners will have quick and easy access to you in case of problems, no matter what time of day or night it might be.
2. Install a fax machine, also connected to an outside line. This provides one more connectivity option should the IVC technology fail or it's after school hours and the front office is closed. The fax machine also offers an easy avenue for sharing documents and critical information during a videoconference.
3. Consider incorporating a laptop lab in the classroom. This provides students with an opportunity to work offline during the course of an IVC class or presentation.
4. Place basic user instructions at each seat and at the teacher podium/workstation.
5. Put operating instructions and other user guidelines in a binder and place it next to the IVC unit.
6. Provide a wall clock so that teachers/presenters can keep track of time and pace their presentation accordingly without looking down at their watch.
7. Turn off the school's intercom system in the IVC classroom.
8. Have someone in the building accessible by phone or beeper to assist with troubleshooting and basic equipment maintenance.

## Staffing

Virtual learning programs, and especially IVC programs, require the expertise and support of several people. Because of limited school budgets, in many cases this support is carried out by one or two people wearing several IVC hats. We believe the following positions—whether staffed by one person or by a couple of multitasking support personnel—are crucial for the operation of a successful IVC program:

- Virtual learning facilitator
- Tech support specialist
- Program support staff
- Teacher of record