

## CHAPTER 13

# Technology in Education

Deborah L. Sopczyk

### CHAPTER HIGHLIGHTS

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#### Health Education in the Information Age

#### The Impact of Technology on the Teacher and the Learner

#### Strategies for Using Technology in Healthcare Education

The World Wide Web

Healthcare Consumer Education and the World Wide Web

Professional Education and the World Wide Web

#### The Internet

E-Mail

Electronic Discussion Groups

Mailing Lists

Usenet

Other Forms of Online Discussion

#### Issues Related to the Use of Technology

#### Professional Education

E-Learning

Distance Education

### KEY TERMS

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Information Age

consumer informatics

World Wide Web

Internet

information literacy

computer literacy

digital divide

e-learning

distance learning

### OBJECTIVES

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After completing this chapter, the reader will be able to

1. Describe changes in education that have occurred as a result of Information Age technology.
2. Define the terms *Information Age*, *consumer informatics*, *World Wide Web*, *Internet*, *information literacy*, *computer literacy*, *digital divide*, *e-learning*, and *distance learning*.
3. Identify ways in which the resources of the Internet and World Wide Web could be incorporated into healthcare education.
4. Describe the role of the nurse educator in using technology in client and staff education.
5. Recognize the issues related to the use of technology.
6. Discuss the effects that technology has had on professional education for nurses.

The end of the twentieth century gave witness to advances in technology that have changed the face of education. The birth of the Internet and the World Wide Web, the development of information technology, the wide-scale production of computers, the development of user-friendly software, and the educational applications that followed have all had profound effects on the way we learn and the way we teach (Heller, Ortos, & Crowley, 2000). Many adult learners can remember a time when writing a paper required traveling to the library to search a card catalog and spending countless hours looking through paper-based books and journals. Today, students have a world of information at their fingertips. Computers and the Internet have made it possible to get information from anyone, anywhere, anytime, within the blink of an eye. Educational technologies, once rare and highly desirable resources, have become commonplace, and both the on-site and distance learner now interact in a multidimensional learning environment. Like shiny new toys, educational technologies have captured the imagination of the world. At the same time, they have presented unlimited challenges and opportunities for educators and learners alike.

This chapter explores the challenges and opportunities resulting from the use of technology as they pertain to health and healthcare education by nurses and professional education for nurses. The use of technology in education has tremendous potential to increase access, to improve educational practices already in place, and to create new strategies that transform teaching and learning experiences for nurses and healthcare consumers. However, technology is not a magic solution that can be implemented without careful planning, monitoring, and evaluation. Although computer-based educational applications have become easier to use and require less technical skill than they did in the past,

the decision to use technology as part of an educational program is likely to have implications related to myriad issues, including access, cost, level of support, equipment, process, and outcomes.

It is important to remember that technology in education is a means to an end, not an end in and of itself. "Without hard questions about learning, technology is like an unguided missile" (Ehrmann, 1995). Although it has incredible power, without careful planning, technology may take you to a place you did not want to go and give results you had not anticipated or desired. Therefore, the nurse who uses technology to enhance learning must not only have a basic understanding of the technology itself, but also be able to integrate the technology into a plan that is based on sound educational principles.

This chapter is designed as an introduction to the use of technology in education. Because nurses provide both healthcare and professional education, it will address technology-based resources and strategies appropriate for use with clients and with nurses and other healthcare professionals. Although it is not intended to provide detailed instruction on the mechanics of computers and other types of hardware and software, the chapter will provide a basic overview of the technology involved and implications for the educator and the learner. Chapter 11 discusses the use of audiovisual materials in the classroom. Hence, this chapter will focus primarily on the Internet, the World Wide Web, and computer-based hardware and software applications that can be used to enhance learning with students in the classroom as well as with learners at a distance.

Before beginning this chapter, it is important to note that the Internet, the World Wide Web, and computer-based technologies are developing at a rapid pace that is accelerating with each new generation of discoveries and

applications (Cetron & Davies, 2001). Because of this phenomenon, consumers are often advised that the computers they bought today are not likely to reflect the “state-of-the-art” technology tomorrow. The same caution must be given to readers of books on technology. Given the pace of technology and the development cycle of a textbook, it is impossible to capture all that is new and cutting-edge in the world of educational technologies in a textbook. Rather, this chapter is meant to serve as a starting point from which you can begin to investigate the educational technologies and resources available. Ideally, it will generate the interest and skill necessary for you to continue to search for new and exciting ways to integrate technology into your teaching and learning activities.

## HEALTH EDUCATION IN THE INFORMATION AGE

The use of technology in education is a reflection of what is happening on a much larger scale in our communities. Hence, it is useful to think of educational technology within the broader context of the environment in which we live and work. We are in a period of history often referred to as the *Information Age*. Mitchel and McCullough (1995) describe the Information Age as a place in time when sweeping advances in computer and information technology have transformed the economic, social, and cultural life of society. If you think about the many ways in which technology has changed the world we live in, it is clear that computers have become more than tools to make life easier—they have become part of our culture.

Computers have also become part of the culture of education. Computers are as common in the educational environment today as chalk and blackboards were in years past. Perhaps the most significant effect computers

have on our society and on education is related to their capacity to assist in the collection, management, transportation, and transformation of information at high speed. As a result of this newfound ability to handle information, we have experienced an “information explosion” and as a society we have increased both our use and our production of information of all kinds. As people living within this information-driven society, we not only benefit from the availability of information but are also challenged to keep up with the information that is bombarding us from all directions. Information and knowledge have become valuable commodities, and the ability to gather and evaluate information efficiently and effectively has become a twenty-first-century life skill.

How has the Information Age changed health education? Consider the following. As a result of technological advances, millions of miles of optical fiber, wire, and air waves now link people around the world to one another and to a vast array of Web-based information. In the United States alone, more than 104 million adults report having Internet access (Rainie & Packel, 2001). By the year 2010, 95% of the people in the industrialized world and half of those in the developing world are predicted to be online and wired for high-speed access (Cetron & Davies, 2001).

As nurses who are providing health and healthcare education, it has never been easier to reach our clients. For the first time, our health and healthcare messages can easily reach beyond local communities to a worldwide audience. Not only can we reach people, but we can also provide interactive learning experiences that extend far beyond what was even imaginable in recent past.

The use of Information Age technology has had such a dramatic influence on health education that a new and rapidly expanding field of study, *consumer informatics*, has emerged.

Also referred to as *consumer health informatics*, consumer informatics is defined as a discipline that “analyses consumers’ needs for information, studies and implements methods of making information accessible to consumers, and models and integrates consumer preferences into medical information systems” (Eysenbach, 2000, p. 1713). Although much attention has been given to computer-based educational systems, consumer informatics is not restricted to computer-based programs and includes the study of a wide range of media that can be used to deliver health-related information.

The entire field of consumer informatics is growing rapidly. Schools such as the University of Maryland and the University of Virginia Health Science Center offer courses of study where healthcare professionals can gain knowledge and skill in using technology to meet the information needs of healthcare consumers. Organizations such as the American Medical Informatics Association (AMIA) have established task forces to identify the issues and explore the roles they might play in guiding the practice of professionals in the field (Kaplan & Brennan, 2001). Informaticians and healthcare professionals are conducting research on the use of technology in healthcare education to generate knowledge that will guide future educational endeavors.

An example of the work of consumer informatics can be found on the “Research Based Web Design and Usability Guidelines” Web site (<http://usability.gov/guidelines/index.html>) sponsored by the National Cancer Institute. This Web site contains guidelines that can be used in designing health-related Web sites. Not only are the guidelines provided here based on research studies and supporting information from the field, but ratings are also assigned to each guideline according to the strength of the evidence available. For example, a guideline that is given a rating of 5 is one that is supported by two or more research studies where hypotheses were

tested and the guideline was shown to be effective. A score of zero indicates that although the guideline may be routinely followed on Web pages, there is no evidence to support its effectiveness.

Despite the rapid growth of technology-based education programs and services, it is important to remember that electronic delivery of health information is in its infancy and there are still many issues that need to be resolved. One major area of concern is the limited oversight and control over the content that is posted on the Internet and World Wide Web, two of the major vehicles for delivering information to a global audience. Many people believe that the lack of censorship on the World Wide Web is a freedom of speech issue. However, healthcare professionals are concerned that consumers are making serious healthcare decisions based on information on the Web that has not been reviewed for accuracy, currency, or bias.

Recently, healthcare education and informatics professionals have begun to work together to develop “codes” to guide practice and safeguard healthcare consumers who use the educational information and services that are delivered via the World Wide Web and the Internet. For example, the Internet Healthcare Coalition, a non-profit group dedicated to quality healthcare information on the Internet, established the *e-Health Code of Ethics* to ensure confident and informed use of the health-related information found on the Internet (Internet Healthcare Coalition, 2000). The *e-Health Code of Ethics* is based upon the principles of candor, honesty, quality, informed consent, privacy, professionalism, responsible partnering, and accountability that are described in more detail in Table 13-1. The *e-Health Code of Ethics* is only one of several codes that have been established. Other codes have been established by the American Medical Association, and by representa-

TABLE 13–1 Guiding principles of the *e-Health Code of Ethics***CANDOR**

- Disclose information about the creators/purpose of the site that will help users make a judgment about the credibility and trustworthiness of the information or services provided.

**HONESTY**

- Be truthful in describing products/services and present information in a way that is not likely to mislead.

**QUALITY**

- Take the necessary steps to ensure that the information provided is accurate and well supported and that the services provided are of the highest quality.
- Present information in a manner that is easy for users to understand and use.
- Provide background information about the sources of the information provided and the review process used to assist the user in making a decision about the quality of the information provided.

**INFORMED CONSENT**

- Inform users if personal information is collected and allow them to choose whether the information can be used or shared.

**PRIVACY**

- Take steps to ensure that the user's right to privacy is protected.

**PROFESSIONALISM IN ONLINE HEALTH CARE**

- Abide by the ethical code of your profession (e.g., nursing, medicine).
- Provide users with information about who you are, what your credentials are, what you can do online, and what limitations may be present in the online interaction.

**RESPONSIBLE PARTNERING**

- Take steps to ensure that sponsors, partners, and others who work with you are trustworthy.

**ACCOUNTABILITY**

- Implement a procedure for collecting, reviewing, and responding to user feedback.
- Develop and share procedures for self-monitoring compliance with the *e-Health Code of Ethics*.

SOURCE: Adapted from the Internet Healthcare Coalition. (2000). *e-Health Code of Ethics*. e-Health Ethics Initiative, 2000 at <http://www.ihealthcoalition.org/ethics/ehcode.html>.

tives of United States-based Healthdot.com organizations (Foubister, 2000).

Sophisticated technology will continue to make health and healthcare information more accessible and more meaningful to both healthcare consumers and healthcare professionals. Educators in all healthcare disciplines are identifying creative ways to use emerging

technology to enhance the teaching–learning process. This trend is reflected in the nursing literature, where an increasing number of articles on uses of technology in professional and patient education can be found. It is important to note, however, that Information Age technology has done more than alter the way in which we teach. As Mitchel and McCullough

(1995) suggest in their definition of the Information Age, technology has and will continue to prompt dramatic, systemwide changes that will be evident in the roles played by nurses and clients, the relationships they establish, and the environments in which they interact.

### THE IMPACT OF TECHNOLOGY ON THE TEACHER AND THE LEARNER

Information Age technology has had a significant influence on educators and learners in all educational settings (Gross, 1999). Access to information bridges the gap between student and teacher. When information is widely available, the teacher is no longer the person who holds all of the answers or the individual who is solely responsible for imparting knowledge. Therefore, educators in the Information Age are becoming facilitators of learning rather than providers of information and are striving to create a collaborative atmosphere in their teaching and learning environments. As information becomes more and more accessible, the need for memorization becomes less important than the ability to think critically. Hence, educators in the Information Age are helping individuals to learn how to refine a problem, to find the information they need, and to critically evaluate the information they find. Healthcare education can and should follow a similar path. As educators, nurses must not only learn how and when to use technology, but also modify their educational approaches to be consistent with the needs of Information Age clients. Nurses must strive to be facilitators of learning and to create learning environments in which clients are encouraged and supported in their attempts to seek the information they need to achieve optimum health.

The Information Age has been witness to some dramatic changes in the behavior of healthcare consumers, making the role

changes discussed earlier inevitable. Technology and the increased accessibility to information it offers have empowered and enlightened healthcare consumers, encouraging them to form new partnerships with their healthcare providers (Kaplan & Brennan, 2001). Even those healthcare consumers who are reluctant to take on more responsibility for managing their own health care are moving in that direction as changes in the healthcare delivery system have forced them to assume more active roles. As a result, healthcare consumers in the Information Age are eager to learn about and make use of the many information resources available to them.

Today's healthcare consumers enter the healthcare arena with information in hand and are prepared to engage in a dialogue about their diagnoses and treatments. We can no longer assume that the clients we see in a hospital or clinic have little information other than what we have given them or that they haven't explored the treatment options available to them. Whereas healthcare consumers of the past were often isolated from others with similar diagnoses and dependent upon healthcare providers for information, today's consumers have the means to access networks of other patients and healthcare providers worldwide. Consumers who are being treated for healthcare problems can readily find detailed information about their diagnoses, treatments, and prognoses. Therefore, it is not surprising that the teaching needs of today's healthcare consumers and the expectations they hold for those who will be teaching them are changing. The role of the nurse educator has not been diminished, but it has changed. Nurses must now be prepared not only to use technology in education, but also to help clients access information, evaluate the information they find, and engage in discussions about the information that is available.

In addition to altering the educational needs and expectations of healthcare consumers, the Information Age has made a

tremendous impact on professional education. Technology has given rise to a dramatic increase in educational opportunities for nurses and other healthcare providers. A 1999 survey of 281 colleges and universities, conducted by the American Association of Colleges of Nursing, found nearly 2,000 course offerings using distance education technology, a number that is expected to continue to grow in the twenty-first century (Potema et al., 2001). Nurses seeking advanced degrees and credentials can now study at colleges and universities offering distance education programs in a wide range of subject areas. Computers have made it possible to provide “anytime, anywhere” access to job training and continuing education. Virtual reality and computer simulation can provide opportunities to learn hands-on skills and develop competencies in areas such as diagnostic reasoning and problem solving. Like consumers, healthcare professionals in the Information Age can use the Internet and the World Wide Web as vehicles for sharing resources and for gaining access to the most current information in their fields of practice.

## STRATEGIES FOR USING TECHNOLOGY IN HEALTHCARE EDUCATION

### The World Wide Web

The technology-based educational resource that is familiar to most people is the World Wide Web. One merely has to turn on a television and hear the commercials for health-related Web sites or hear references to the Web on morning talk shows to appreciate its tremendous influence. A report produced by the Pew Foundation revealed that 52 million Americans, or more than half of all Americans with Internet access, have used the World Wide Web to obtain health-related information (Fox & Rainie, 2000). Healthcare consumers are bombarded with lures to the Web; once there, Web users can find anything from

videos of surgical procedures to sites where they can ask questions as well as receive information. The number of healthcare sites on the World Wide Web is difficult to capture with any accuracy, as new sites are being introduced on a daily basis. Nevertheless, it is estimated that more than 15,000 Web sites are devoted to healthcare issues and that they receive in excess of 22 million hits per month (Paris, 2001).

Having recognized the value of the World Wide Web, nurses and other healthcare educators are beginning to teach their clients how to use the Web to find the resources and healthcare information they need to become educated healthcare consumers. The nursing literature suggests that the Web is being incorporated into formal teaching plans for health and healthcare education with increasing frequency (Grandinetti, 2000; Leaffer & Gonda, 2000). Web pages designed to provide healthcare education are also being created by nurses as part of their outreach efforts to the community. Although healthcare information on the Web is a relatively new phenomenon, it has generated so much interest that several professional publications devoted to the topic have been initiated. For example, *The Interactive Health Care Report* was launched in 1999 to cover new developments in the world of digital healthcare information and to assist practitioners in keeping up with available resources on the World Wide Web. One feature found in the nursing journal *Computers in Nursing* is a listing and review of Web sites devoted to a particular health or nursing-related topic each month.

It is clear that the World Wide Web is an exceptionally rich educational resource for both professional and consumer use. However, despite people’s familiarity with the Web, there is some confusion regarding terminology. Therefore, it may be helpful to clarify some commonly used terms.

From a technical perspective, the *World Wide Web* is a network of information servers around the world that are connected to the

Internet. The servers that make up the World Wide Web support a special type of document called a *Web page*. Web documents or Web pages are written using HTML (Hypertext Markup Language). In simple terms, the World Wide Web is a virtual space for information. More than 1 billion Web pages covering a wide range of topics can be found on the Web, displaying a variety of formats including text, audio, graphics, and, in some cases, video (Why-not.com, 2001). Links on a Web page allow the user to easily move from one Web page to another with the click of a mouse. A user moves around the World Wide Web by way of a *Web browser*, a special software program that locates and displays Web pages. Netscape Navigator and Microsoft Internet Explorer are examples of Web browsers. *Search engines* and *search directories* are computer programs that allow the user to search the Web for particular subject areas. Yahoo! is an example of a search directory, and Google is an example of a search engine. The Web is so large that any one search engine or directory will cover only a small percentage of the Web pages available (Pandia.com, 1999).

A common misconception is that the World Wide Web and the Internet are two names that describe the same entity. In fact, the Internet and the World Wide Web are related but different.

The *Internet* is a huge global network of computers established to allow the transfer of information from one computer to another. Unlike the World Wide Web, which was created to *display* information, the Internet was created to *exchange* information. The World Wide Web resides on a small section of the Internet and would not exist without the Internet's computer network. Conversely, the Internet could exist without the World Wide Web and, in fact, flourished for many years before the World Wide Web was ever conceived. Despite the immense size of both the Internet and World Wide Web, the two are relative newcomers to the world of technology. The Internet was originally com-

missioned in 1969 as a program of the Department of Defense, and the first experimental version of the World Wide Web was released only in 1989 (Howe, 2001). Since their inception, both the Internet and World Wide Web have grown dramatically in size and functionality.

Nurses or healthcare consumers need to go no farther than their computers if they wish to learn how to use the Internet or the World Wide Web. Getting into the Internet or the World Wide Web requires a computer with a modem or other telecommunication link and software to dial into an Internet Service provider (ISP). Once connected, it is simple to find a wide range of Web sites devoted to teaching Internet or World Wide Web navigation skills. With a properly worded command (e.g., "*World Wide Web*" and *tutorial*), a search engine will uncover a number of self-paced tutorials designed to teach novice or intermedicate users the desired skills. Most search engines even provide guidance in creating commands that will elicit the information needed.

Knowledge of the World Wide Web is critical for nurses who work with and educate healthcare consumers for several reasons:

- Nurses will inevitably see an increase in the number of clients who enter the healthcare arena having already searched the Web for information. Familiarity with the type of information found on the Web will help direct the assessment of clients prior to teaching to identify the needs of the learner and to determine whether follow-up is necessary.
- The World Wide Web is a tremendous resource for both consumer and professional education. To use the Web effectively, nurses must possess information literacy skills and be prepared to teach these same skills to clients, including how to access the information on the Web and how to evaluate the information found.
- The World Wide Web provides a powerful mechanism for nurses to offer healthcare

education to a worldwide audience. More and more health organizations are creating Web sites with pages dedicated to presenting healthcare information for consumers. Although nurses may not be responsible for actually creating the HTML document that will be placed on the Web, they may work with the Web site designers to develop the information it contains, evaluate the accuracy of the information presented, and interact with healthcare consumers who access the site.

The World Wide Web is a vital tool for nurses. It is mechanism for keeping up-to-date on professional and practice issues as well as a resource to be shared with clients. If it is to be used effectively, however, a plan to incorporate the World Wide Web into practice must be set in place.

### Healthcare Consumer Education and the World Wide Web

Preteaching assessment of a client in the Information Age must begin with questions about computer use. It is important to determine whether a client has a computer, has access to the Internet, is knowledgeable about using a computer, and has interest in using a computer to obtain information and resources regarding his or her health care. If a client does not have a computer but has interest in using one to access resources on the Web, places where he or she may access a computer should be discussed. Libraries, senior centers, and community centers commonly have computers with Internet access for public use and typically offer instruction and assistance for new users (Hendrix, 2000).

Clients who use computers should be asked about their use of the Web. A Pew Foundation study found that approximately 21 million Web users in the United States found information on the Web that either (1) influenced their decisions about how to treat an illness, (2) led them to ask questions, (3) led them to seek a second medical opinion, or (4)

affected their decision about whether to seek the assistance of a healthcare provider (Fox & Rainie, 2000). Because the Web can be so influential, it is important to determine that the information a client has found is accurate, complete, and fully understood. The World Wide Web contains information designed for both professional and consumer audiences. Healthcare consumers may not have the background necessary to comprehend professional literature and other types of information designed for healthcare professionals. When healthcare consumers do a search on a topic, they will access Web sites designed for them as well as for health professionals. Consumers should not be discouraged from accessing these sites, but nurse educators must help clients find information written for them at their level of readability and comprehension. A research study conducted by Graber, Roller, and Kaeble (1999) examined the readability level of medical information on the Web and found that many patient education materials are not written at a grade level that can be easily understood by the majority of the public (see Chapter 7 on literacy).

The Web also contains information that may be biased, inaccurate, or misleading. Because the Web has the potential to change so quickly, it is difficult to regulate. Even Web pages sponsored by physicians, nurses, and university medical centers have been found to contain inaccurate information and treatment recommendations (Kiernan, 1998; Paris, 2001).

Some clients may find that the Web has provided too much information, information they are not ready to handle or information they do not fully understand. For example, a patient newly diagnosed with a serious illness may be overwhelmed with the detailed information found on the Web regarding the course of the disease, prognosis, and treatment. Therefore, it is important to ask clients if they are using the Web to find health-related information and to explore the types of information they have found. Clients may or may not initially feel comfortable talking

about information they have gathered. They may fear you will interpret their research as a lack of trust in your care. Some may be embarrassed to talk about information they do not fully understand. Others may be anxious about how to bring up information that conflicts with what they have been told or how they are being treated.

For these reasons, it is important to establish early in your relationships with clients that you are interested in talking with them about the information they have gathered from the Web or other resources they have available to them. Clients need to feel that you are open to discussing whatever information they find and that you are a partner in seeking the best information available. For clients who are being treated for a condition over an extended period of time, it is also important to continue the conversation about their Web searches throughout their treatment. Simply asking “Have you found any interesting information on the Web lately?” will keep the dialogue open and provide the nurse educator with the opportunity to respond to whatever questions or concerns they may have.

If possible, it is advantageous to conduct a teaching session in a place where there is computer access. Having a computer available during a teaching session can accomplish several goals. First, it will provide you with the opportunity to review Web-based information with the client. Not only can you introduce Web sites that are relevant to the client’s needs, but you can also review some of the sites the client has been using. By reviewing the Web sites a client has been visiting, you can begin to determine the type and amount of information to which the client has been exposed, assess the client’s knowledge, and identify areas where the client may have need for further teaching. You may also find information that needs further discussion. For example, a client may have visited a Web site that provides distressing information about side effects of treatment, prognosis, or disease progression. Looking at the site together will

give you the stimulus to talk with the client about what he or she has discovered and do additional teaching if needed.

Another important advantage of reviewing Web sites with a client is that it provides a chance to teach clients information literacy skills. *Information literacy* is defined as “the ability to access, evaluate, organize, and use information from a variety of sources” (Humes, 1999). If clients are going to make use of the vast array of information on the Web, they must be able to find the information they are looking for, judge whether the information they find is trustworthy, and decide how they will use the information to meet their needs. Information literacy is different from *computer literacy*, the ability to use the necessary computer hardware and software (Association of Colleges and Research Libraries, 2000). A client who is information-literate knows how to find the information needed and can evaluate the information found for accuracy, currency, and bias.

Although healthcare consumers may not have the background knowledge to evaluate information to the same extent as a professional, they can be taught some simple steps to develop their information literacy skills and to help them begin to identify which Web sites are useful and which are problematic. These steps include the following:

1. *Reducing a problem or topic to a searchable command that can be used with a search engine or search directory.* If clients do not know how to narrow their topics or problems to a few words, they will be unable to find the information they desire or may be unable to broaden a search to find comprehensive coverage. Once the search command is identified, using a search engine or search directory is easy, especially if the help function available at most sites is used to solve problems.
2. *Categorizing Web pages according to their purpose.* A client should be taught to look for the person or organization responsible for the Web site and then place the Web

site into a category reflective of its purpose. For example, the purpose of a site created by a drug manufacturer could be categorized as marketing, sales, or promotion. Other categories could include, but are not limited to, advocacy, promotion, informational/news, personal, or instructional/tutorial.

3. *Identifying sources of potential bias that may influence the content or the manner in which the content is presented.* For example, an advocacy Web site is likely to present information that favors one side of a debate. A marketing or sales site will have a tendency to include information that is supportive of a particular product or service.
4. *Making a judgment as to the likelihood that the information found on the Web page is accurate and reliable.* Clients can be taught to look for the credentials of authors of reports or articles found on the Web, to see whether supportive data are provided, and to look at more than one site to see if they can find similar claims or suggestions. Some of the more reliable health-related Web sites have links to other sites such that the original site is not the sole source of information on a particular topic.
5. *Making a decision as to the completeness or comprehensiveness of the information presented.* Because clients may not have the background knowledge needed to quickly recognize when information is missing, they should be encouraged to look at more than one site when researching an area of interest. If you know that clients are using the Web to investigate a particular topic, you can help them to identify a list of things they should look for in articles or Web pages addressing the topic.
6. *Determining the currency of the information on a Web page.* Consumers need to know the importance of looking for a creation or modification date or other signs that the information on a Web site is up-to-date.

7. *Identifying resources to answer questions or verify assumptions made about the content of a Web page when necessary.* Healthcare consumers should be encouraged to check out information with their healthcare provider or other healthcare professional.

In years past, healthcare consumers were not encouraged to research healthcare topics but rather to rely on their healthcare providers for information. There were fears that clients would not understand the information they found or that they would find information they wouldn't be able to handle. Today, we have more confidence in the consumer's ability to manage his or her own health care. More and more nurses are empowering their clients by teaching and encouraging them to take advantage of the resources at their disposal. Nurses are using a variety of means to expose their clients to the resources on the Web. For example, nurses are placing computers in patient waiting rooms with appropriate Web sites set up in a "point and click" format (Klemm, Hurst, Dearholt, and Trone, 1999). Others are preparing teaching materials on how to use the Web and what to look for once there.

There are many reasons why teaching clients where to go on the Web to find information is good practice. Web-based information can be obtained quickly, and the cost of Internet access in the home is minimal. In fact, Internet access is even available for free in libraries and other community service organizations. Many healthcare consumers would benefit from having their questions answered quickly and inexpensively. For example, families with young children are likely to have frequent questions related to childhood illnesses, growth and development, and behavior problems and may not have the time or money to make a visit to the pediatrician. Senior citizens may have questions about the healthcare problems encountered with aging but may have difficulty getting to a healthcare provider because of transportation and financial issues. People with chronic illness may

gain some sense of control over their lives when they are able to access information on the Web about their conditions. Healthy people may have many questions but few opportunities to talk with a health provider to get answers. Even when healthcare consumers do have the opportunity to meet with a healthcare provider, they often leave with unanswered questions. Sometimes they forget to ask, at times they are hesitant to ask, and in today's healthcare delivery system they may not be given sufficient time to ask the many questions that arise when people are dealing with health issues.

In the role of educator, the nurse can teach clients who access the Web to use it more effectively and can be proactive in encouraging others to give it a try. It may be helpful to compile lists of Web sites appropriate to the needs of different client populations. Table 13-2 provides examples of the various types of Web sites that are available for consumer use. As illustrated in Table 13-2, a variety of types of Web sites exist, from general sites covering a broad range of topics to sites with a specific focus or theme. Megaportals, or sites where health is just one of many topics covered, do exist, but are on the decline and being replaced with sites that focus on a single theme such as cancer (Kaplan & Brennen, 2001).

In selecting Web sites to share with clients, it is important that the nurse review them carefully. In recent years, multiple rating scales have been developed to assist in the evaluation of such sites. Most scales include criteria that address the accuracy of the content, design, and aesthetics of the site; disclosure of the authors; sponsors of the site; currency of information; authority of the source; ease of use; and accessibility and availability of the site (Kim, Eng, Deering, & Maxfield, 1999). Table 13-3 summarizes the questions that should be asked in evaluating a health-related Web site. Resource lists made up of quality sites will not only serve as references

for clients but also provide examples of the types of sites they should be accessing.

Finally, nurses can create Web sites to bring their healthcare messages to Web users around the world. Table 13-2 provides two examples of Web sites that exemplify the types of roles nurses can play to bring health information to various consumers via the World Wide Web. *Band-aids and Blackboards* is a creative site designed by a nurse to facilitate understanding of the problems faced by children growing up with healthcare problems. This site is thought-provoking rather than factual. The nurse who created it uses the words and drawings of children and parents to bring a real-life perspective to the thoughts, feelings, and experiences of growing up with illness. *Band-aids and Blackboards* teaches important messages about not being alone, about ways to solve common problems, and about what really matters to this population. *NetWellness*, another site in which nurses play a predominant role, is a very different site than *Band-aids and Blackboards*. *NetWellness* is an "electronic consumer health information service developed by the University of Cincinnati Medical Center and more than 35 community partners" (Hern, Weitkamp, Haag, Trigg, & Guard, 1997, p. 316). Nursing faculty at the University of Cincinnati, Ohio State University, and Case Western University assist in maintaining the site by responding to health consumer questions on the site's "Ask the Expert" feature and by providing information for the section of the site devoted to "Hot Topics."

A number of issues must be considered before engaging in health education via a Web site. Web sites have the potential to reach millions of users over an extended period of time. The healthcare consumers who use the Web have varying levels of sophistication. They may or may not know to check the dates on which the Web site was created and modified. Therefore, it is very important that the infor-

TABLE 13–2 Sample Web sites for healthcare consumers

Title	URL	Sponsor/Author	Description
Medline Plus	<a href="http://www.nlm.nih.gov/medlineplus/">www.nlm.nih.gov/medlineplus/</a>	National Library of Medicine	Example of a government site that provides access to extensive information about specific diseases/conditions, links to consumer health information from the NIH, dictionaries, lists of hospitals and physicians, health information in Spanish and other languages, and clinical trials. There is no advertising on this site.
Virtual Hospital	<a href="http://www.vh.org/">http://www.vh.org/</a>	University of Iowa	Example of a university site created to help meet the information needs of healthcare providers and patients. The digital information provided is all dated and reviewed for quality and accuracy.
Aplastic Anemia and MDS International Foundation, Inc.	<a href="http://www.aplastic.org/">http://www.aplastic.org/</a>	Aplastic Anemia and MDS International Foundation, Inc.	Example of a disease-specific Web site that provides a range of services, including free educational materials and access to a help line where consumer questions will be researched and answered.
National Center for Infectious Diseases Travelers Health	<a href="http://www.cdc.gov/travel/index.htm">http://www.cdc.gov/travel/index.htm</a>	Centers for Disease Control and Prevention	Example of a government site designed to provide a wide range of health-related information for travelers, including traveling with children, travelers with special needs, and specific disease information.
MayoClinic.com	<a href="http://www.mayohealth.org">http://www.mayohealth.org</a>	Mayo Clinic	Example of a comprehensive hospital site that provides information as well as a variety of interactive tools to help healthcare consumers manage a healthy lifestyle, research disease conditions, and make healthcare decisions. Advertisement helps support this site.
Cancer Net	<a href="http://www.wicic.nci.nih.gov/">http://www.wicic.nci.nih.gov/</a>	National Cancer Institute	Example of a government site devoted to all aspects of cancer. Provides both professional and consumer-oriented information and resources.

*(continued)*

**TABLE 13–2 (continued)**

<b>Title</b>	<b>URL</b>	<b>Sponsor/Author</b>	<b>Description</b>
Band-aids and Blackboards	<i><a href="http://www.faculty.fairfield.edu/fleitas/contents.html">http://www.faculty.fairfield.edu/fleitas/contents.html</a></i>	Nursing faculty members at Fairfield University	Site provides personal rather than factual information about growing up with health problems from the perspectives of kids, teens, and adults.
NetWellness	<i><a href="http://www.netwellness.org/">http://www.netwellness.org/</a></i>	University of Cincinnati, Ohio State University, and Case Western Reserve University	Nonprofit consumer health Web site that provides high-quality information created and evaluated by medical and health professional faculty at several universities.

**TABLE 13–3** Criteria for evaluating health-related Web sites**ACCURACY**

- Are supportive data provided?
- Are the supportive data current and from reputable sources?
- Can you find the same information on other Web sites?
- Is the information provided comprehensive?
- Is more than one point of view presented?

**DESIGN**

- Is the Web site easy to navigate?
- Is the site “Bobby Approved”?
- Is there evidence that care was taken in creating the site? Do the links work? Are there typos?
- Is the information presented in a manner that is appropriate for the intended audience?
- Do the graphics serve a purpose other than decoration?

**AUTHORS/SPONSORS**

- Are the sponsors/authors of the site clearly identified?
- Do the authors provide their credentials?
- Do the authors/sponsors provide a way to contact them or give feedback?
- Do the authors/sponsors clearly identify the purpose of the site?
- Is there reason for the sponsors/authors to be biased about the topic?

**CURRENCY**

- Is there a recent creation or modification date identified?
- Is there evidence of currency (e.g., updated bibliography reference to current events)?

**AUTHORITY**

- Are the sponsors/authors credible (e.g., is it a government, educational institution, or healthcare organization site versus a personal page)?
- Are the author’s credentials appropriate to the purpose of the site?

mation on the site be accurate and updated as often as necessary. Depending on the topics covered, it may be necessary to include a disclaimer about the importance of checking with a healthcare provider.

If the site is interactive and the nurse will be responding to questions submitted by users of the site, liability issues must be carefully considered. Nurses who respond to questions from Web users are providing advice and guidance to people they do not see and cannot assess. Depending on the nature of the site, it may be advisable to include an attorney on the team to provide advice when needed (Hern et al., 1997). It is important to determine if there are relevant legal issues related to practice inherent in the activities of the nurse on the Web site. Although new technology has opened the door to many new and exciting opportunities, it has also raised many questions about “telepractice” and licensure. Because technology makes it so much easier than ever before to provide healthcare services to clients across state lines, the provision of nursing, medical and other types of technology-facilitated healthcare services to clients at a distance has been placed in the spotlight. Multi-state licensure and other types of legislation have and will continue to be proposed and new practice guidelines are likely to be enacted.

Finally, the time commitment required to respond to questions from Web users cannot be underestimated. The nurse educators who respond to questions on NetWellness estimate a time commitment of 20–40 minutes for research and response to each question (Hern et al., 1997). They also suggest that it is important that daily coverage for an interactive Web site be maintained. Healthcare consumers will use the site 24 hours a day, 7 days a week. Therefore, if the site offers interactive features such as “Ask an Expert,” it is important that questions be answered on a regular basis so

that service is not interrupted for long periods of time.

### Professional Education and the World Wide Web

The World Wide Web provides unlimited resources for nurses to use in practice and in professional education and development. Web sites provide access to bibliographic databases, continuing education, on-line journals, and resources for patient teaching and professional practice. Sites established by nursing organizations and publishing companies serve as “resource centers” where nurses can find a wide range of information and services addressing any number of educational needs. Many of the informational sites on the World Wide Web provide both consumer and professional education. Some Web sites provide links on the home page directing users to either consumer or healthcare professional resources. Other sites do not attempt to discriminate and allow users to decide whether consumer material or professional literature is more appropriate to their needs.

It is impossible to list all of the educational opportunities for professionals found on the World Wide Web. The Web is constantly changing, with new sites being added and others being removed on a daily basis. Table 13–4 provides examples of the various types of Web sites that can be used by professional nurses and other healthcare professionals.

## THE INTERNET

The World Wide Web is merely a small component of a much larger computer network called the Internet. Although the Internet does not provide the eye-catching Web pages and the multimedia found on the World Wide Web, it does offer a wide range of services, many of which can be used to deliver health and healthcare education to clients. The Inter-

net services most likely to be of interest to nurse educators include those that allow computer-facilitated communication. While the World Wide Web provides opportunities to send healthcare messages to large groups of people in the form of educational Web pages, the Internet can be used to enhance teaching by enabling individuals to communicate with one another and with groups of people via the computer. Electronic mail (e-mail), real time chat, and e-mail discussion or Usenet newsgroups have all been used to communicate with people about health and health care, some in very creative ways.

### E-Mail

A television commercial for a popular Web site was created to encourage women to log on to the Web site for answers to health-related questions. The commercial shows a woman speaking about all of the unanswered questions she has had following a visit to her healthcare provider. The woman in the commercial talks about the lack of time, the questions that she did not think about until after she got home, and her hesitancy to “bother” her healthcare provider with “silly” questions. Although this commercial did not involve a real patient, the message that was conveyed by this fictitious scenario is quite relevant. Despite the best efforts of healthcare professionals to provide needed information to consumers, time, stress, fear, lack of experience, and simple human dynamics may result in clients walking away from a visit to a healthcare provider with incomplete or inaccurate information. Sometimes questions come up only after clients go home and try to follow the instructions they have been given. At other times, they may misunderstand what is being taught or be afraid or hesitant to admit that they do not understand. Unless there is a mechanism in place for clients to contact the nurse with questions, the client is at risk for

TABLE 13–4 Sample Web sites for healthcare professionals

Title	URL	Sponsor/Author	Description
Medline	<a href="http://www.nlm.nih.gov/pubs/factsheets/medline.html">http://www.nlm.nih.gov/pubs/factsheets/medline.html</a>	National Library of Medicine	Example of a government site providing access to a bibliographic database containing more than 11 million references to journal articles in the life sciences.
SchoolNurse.com	<a href="http://www.schoolnurse.com/">http://www.schoolnurse.com/</a>	School Nurse Alert	Example of a commercial site devoted to school nursing. It contains a wide range of resources, including links of interest to school nurses, continuing education offerings, and a bibliographic search feature.
Speaker Kit on Lung Health in Minorities	<a href="http://www.chestnet.org/minorities/">www.chestnet.org/minorities/</a>	American College of Chest Physicians	Example of a site that provides resources for education. This site contains a Power-Point presentation that can be downloaded and used when presenting information to minority groups about lung health.
National Kidney and Urologic Diseases Information Clearinghouse	<a href="http://www.niddk.nih.gov/health/kidney/nkudic.html">http://www.niddk.nih.gov/health/kidney/nkudic.html</a>	National Institutes of Health	One example of the kinds of disease-specific information that is available from the federally funded National Institutes of Health. It provides access to statistical data about kidney disease, free educational materials prepared at different reading levels, and access to a database of health education materials produced by health-related agencies of the federal government.

(continued)

TABLE 13–4 (continued)

Title	URL	Sponsor/Author	Description
Gradschools.com	<i>www.gradschools.com</i>	Educational Directories Unlimited	Example of a commercial site that provides a wide range of information and services for students interested in graduate study. Campus-based and distance education nursing programs are among the more than 52,000 graduate programs listed in the site's database.
Auscultation Assistant	<i>http://www.wilkes.med.ucla.edu/intro.html</i>	University of California Medical Student	One example of the numerous Web sites devoted to teaching heart and breath sounds. This site provides information as well as audio clips of various heart and breath sounds.
NursingCenter.com	<i>http://www.nursingcenter.com/</i>	Lippincott, Williams & Wilkins	Example of a commercial site that was originally funded by a federal grant for the purpose of developing an interactive Web community for nurses. It contains a wide range of information and services about continuing education offerings, degree programs, and reference material.

making a mistake that may have serious consequences. Simply telling clients to call if they have questions is often inadequate. A call to a busy office or clinic usually results in a call back and having to wait by the phone for an answer. Even calling hours can be problematic because they imply that the client is free to call at the designated hour.

E-mail offers a quick, inexpensive way to communicate with clients. It has the advantage of being *asynchronous*, which means that the message can be sent at the convenience of the sender and the message will be read when the receiver is online and ready to read it. Messages can be sent and responded to any time, day or night. E-mail is also a technology that is growing in popularity and use. It is estimated that 56 percent of all adults in the United States are online. Of those people who use the Internet, 93 percent use e-mail and spend an average of 4.2 hours per week engaged in e-mail and other Internet-based activities (Rainie & Packel, 2001).

Despite the fact that electronic mail can provide a simple and efficient way to do follow up with clients, nurses are just beginning to recognize its potential. To date, little has been written in the literature about ways in which nurses have used e-mail to communicate with clients. Some of the reasons nurses identify for not using e-mail include lack of instruction and support, limited access to computers, and preference for face-to-face communication (Hughes & Pakiesner, 2000). It should be noted that although there is little information about e-mail in the nursing literature, electronic communication has received much attention in the medical and general health literature.

E-mail is clearly a trend worth watching. In fact, in a discussion of health care in the twenty-first century, the National Institute of Medicine (2001) proclaimed that both patients and clinicians could benefit from improvements in timeliness through the use of Internet-based communication. Studies suggest that patients are interested in communicating

with their healthcare providers via e-mail. One survey found that one-third of online health seekers would consider switching healthcare providers if they could communicate with them via e-mail (Kassirer, 2000). A recent editorial in *The New England Journal of Medicine* states that "e-mail has the potential to induce cultural changes in the delivery of care even more revolutionary than any restructuring going on today" (Paris, 2001, p. 15).

Given the opportunity e-mail provides for enhanced communication with clients, it is an approach worthy of further study by nurses. An e-mail message system gives clients who identify questions after they go home a chance to get answers from a reliable source familiar with their history. Clients who are not sure how to phrase a question or feel rushed when instructions are being given in a clinical setting have a chance to compose their thoughts at home and prepare an e-mail message. Also, from the nurse's perspective, an e-mail message system provides a simple way to check on clients to see whether they understood the instructions they were given and to respond to new questions that have arisen.

In some ways, an e-mail system is preferable to a voice messaging system. For clients who are anxious about asking questions, e-mail allows them all the time they need to gather their thoughts. In addition, clients do not have to remember the answers they are given by the nurse, as the e-mail message provides a written recording of the nurse's response. In contrast, many voicemail systems are time-limited. Clients are sometimes cut off in the middle of a voice message if the message is long or if clients are struggling to make themselves understood. Other clients may hesitate to leave a voicemail in the evening or night hours when they know no one is there to respond. However, by virtue of the way e-mail is designed, clients can feel comfortable sending messages at any time.

An e-mail message system is simple to implement. Client e-mail addresses need to be

identified as part of the routine information-gathering process for new clients. Because e-mail addresses are likely to change, they need to be updated, just like telephone numbers, whenever a client visits the office, clinic, or other setting within the healthcare delivery system. It is a good idea to have more than one person be responsible for responding to e-mail messages, so that questions and concerns can be addressed even when a staff member is away due to vacation or time out of the office. One way to accomplish this goal is to have messages be sent to a mailbox rather than to an individual. Because more than one person can be given access to an electronic mailbox, continuous coverage can be established. If continuous coverage is not provided, it is important that clients know how long they can expect to wait to receive answers to their questions.

E-mail systems can be set up to serve a variety of purposes. If post-teaching follow-up is desired, e-mail offers one way for the nurse to initiate contact after the client has left the healthcare delivery system. The nurse can get in touch with the client via e-mail following a teaching session to convey interest in how he or she is doing with a medication regime, treatment, or other types of instructions given. The e-mail message could stress important points that were made during the teaching session—for example, “Remember to take your pill around the same time every day.” An e-mail message could also be used to assess the client’s understanding of what was taught. For example, a client might be asked: “What time of day have you decided to give your child his medication?” In all cases, the nurse should encourage the client to get in touch if questions remain. Any follow-up system will take time and commitment on the part of the organization. Time and resources must be allocated if the system is to work effectively.

An e-mail system can also be established as a mechanism to answer questions and

exchange health-related information with clients who have received services at a particular healthcare organization. An “e-mail question box” can provide simple access to the nurse or other health educator who can serve as a reliable source of information. For this type of system to work, the e-mail address for the mailbox needs to be widely distributed and easy to remember. For example, a mailbox address such as *Questions@RDClinic.org* would be easy to remember because it includes the purpose of the mailbox and the name of the organization. The e-mail address can be placed on the bottom of written instructions, teaching materials, appointment cards, and other sources of communication with the client. A description of the service and instructions for use should also be distributed. For example, it may be helpful for clients to know who will be answering their questions, the types of questions that can be submitted, and the typical response time. Also, it is very important that clients understand that an e-mail message system is not intended to replace a visit or phone call when they need to see or talk with a healthcare provider about an immediate problem.

When sending e-mail messages, it is important to remember that electronic communication differs in several ways from face-to-face communication:

- Electronic communication lacks context. Without cues like facial expressions, tone of voice, and body posture, e-mail messages can appear cold and unfeeling. While *emoticons* (symbols like “smiley faces” used to express emotion) are commonly used by people who send e-mail messages, they may not be appropriate for all professional correspondences. However, a carefully constructed e-mail message can convey the intent of the sender.
- Although electronic communication is convenient, it may take longer in that the

sender could wait hours or days before the message is received and answered. For this reason, it is very important that an e-mail response to a client question be clear and of sufficient detail so that it does not generate more questions that cannot be answered immediately.

- E-mail messages provide a written record. A printed copy can serve as a handy reference for a client, but it can also serve as documentation of inaccurate or inappropriate information. When responding to a client question, it is vital that the client's record be reviewed and that the response to the question be accurate and carefully thought out. Copies of the e-mail messages sent to clients should be placed in the client's record.
- Electronic communication can never be assumed to be private. Therefore, it is important that both nurses and clients understand that violations of privacy can occur in many ways. For example, clients who send e-mail messages from work may not be aware of the fact that their messages may be stored on servers and hard drives even after they have been deleted. In some cases, the employer may have legal access to this information (Kassirer, 2000). E-mail messages can also be easily forwarded. Therefore, the nurse should assume that the client may choose to share a response with others.

E-mail communication between nurse and client has tremendous potential to enhance teaching. However, despite the increased use of e-mail among the general population, it is important to remember that not every client has a computer, computer skills, or access to e-mail. A backup system such as voicemail should therefore be made available so that the needs of all clients will be met.

### Electronic Discussion Groups

The Internet provides many opportunities for clients and healthcare professionals to partici-

pate in electronic discussion groups with other people who share a common interest. In the case of health and healthcare education, common interests can focus on a particular healthcare problem such as cancer, a life circumstance such as death of a spouse, a health interest such as nutrition, or a professional issue such as nursing research. Although different types of electronic discussion groups are available, all share a common feature—the ability to connect people asynchronously from various locations via computer. People like electronic discussion groups because they are easy to use and are available 24 hours a day. Because electronic discussion involves “faceless” communication with strangers from all over the world, there is a sense of anonymity even when real names are used.

Electronic discussion groups fall into two main categories: those that distribute mail to individual subscribers and those that post messages in a way that make them accessible to group participants. In the first case, messages are sent to the individual; in the second case, the subscriber seeks out the messages that have been posted. Electronic discussion groups can be structured in many different ways. Some are moderated, whereas others have little or no oversight. Some electronic discussion groups have thousands of subscribers, whereas others are very small closed groups created for specific purposes.

For the nurse, electronic discussion groups can serve as either a vehicle for teaching or a learning resource to share with clients and other healthcare professionals. The nurse who chooses to create an electronic discussion group can use it to reach large or small groups of healthcare consumers or healthcare professionals from within the immediate vicinity or worldwide. For example, a number of electronic discussion groups have been created and moderated by nurses as a way to promote

networking and information sharing among nurses within a particular specialty area. These groups are open to anyone who is interested and typically have memberships of several hundred people from countries around the world. In comparison, nurses in a hospital or clinic could choose to set up a small private electronic discussion group as a way to facilitate a journal club. Whether the group is large or small, the asynchronous nature of electronic discussion groups makes it possible for people to communicate with one another despite different time zones and work schedules.

Whether the nurse chooses to create an electronic discussion group or uses one already in existence, this form of online communication provides for a creative way to learn and to teach. The two major formats used to create electronic discussion groups, those that distribute mail (mailing lists) and those that post it (newsgroups), are discussed next.

### **Mailing Lists**

Automated mailing lists are one of the most common means of setting up an electronic discussion group. With an automated mailing list, people communicate with one another by sharing e-mail messages. The principle by which these groups work is simple. Individuals who have subscribed to the mailing list send their e-mail messages to a designated address, where a software program then copies the message and distributes it to all subscribers. Therefore, when a message is sent to the group, everyone gets to see it.

The most popular of these automated software programs is called "Listserv." In fact, the Listserv program is so commonly used that automated mailing lists are often referred to as "listservs." Other automated programs include Majordomo, Mailbase, and Listproc. Although some minor differences exist between these programs, essentially they all work in the same way.

Although mailing lists are owned or managed by an individual, much of the work

involved in running the list is automated by the software program used. Subscribers are given two e-mail addresses to use when interacting with the mailing list: one to use when posting messages to the entire group and another to use for administrative issues such as requests to stop mail for a period of time. Both functions—distributing messages and handling routine requests—are automated and handled by the software program rather than by a person. Subscribers must use the correct address and precisely worded commands when attempting to interact with the list because the computer program cannot problem solve. Upon enrolling, subscribers are sent directions and a list of properly worded commands that should be used when "communicating" with the software program. New subscribers are encouraged to save the instructions and refer to them as needed. Despite these precautions, new users frequently make mistakes. It is not uncommon to read messages from frustrated subscribers who cannot stop their mail because they are either posting to the wrong address or failing to use the correct command.

Listservs and other automated mailing groups are wonderful tools for the nurse when used as a means for delivering education to large numbers of people or when shared with clients and colleagues as a learning resource. Mailing lists are easy to use once a user understands how the system works and there are multiple free tutorials available on the Web to help. With more than 100,000 listservs and mailing lists available, it is possible to find an online group to cover almost any issue. The quality of the messages is usually very high in both health-related and professional mailing lists. Nurses who choose to create a group rather than to participate in an established one can learn to manage a large or small listserv without too much difficulty. However, it is helpful for list managers to have either the support of computer professionals in their institution or the knowledge

and skill necessary to handle the routine computer issues that arise from time to time.

Listservs or mailing lists can be used effectively as a vehicle for education or information exchange with groups desiring education or information exchange over time. Because mailing lists facilitate group rather than individual communication, they work especially well with groups that are interested in collaborative learning or learning from the experiences of others. Mailing lists designed for professional audiences are good examples. Multiple lists or listservs are available covering everything from nursing history to nursing research to specific areas of nursing practice. Most lists are quite active and, at any given time, several discussion topics can be addressed by the group. Members post questions, ask advice, and comment on current issues. Relationships between active members are established over time, and group members come to count on others in the group for their counsel.

For these same reasons, listservs and other types of automated mailing lists have become popular as mechanisms for online support for health consumers (Bliss, Allibone, Bontempo, Flynn, & Valvano, 1998; Han & Belcher, 2001; Klemm, Reppert, & Visich, 1998). With the increased use of computers in the general population, an increasing number of people have turned to their computers to access information and resources that can help them deal with their health issues. As a result, the need for electronic discussion groups devoted to particular health problems was identified and online support groups were established. The Association of Cancer On-line Resources, Inc. (ACOR), has been a major player in the move to bring online support to healthcare consumers (Han & Belcher, 2001). This nonprofit organization devoted to assisting people with cancer has established more than 70 different online support groups since 1996, each devoted to a particular type of cancer or cancer-related problem. Its Web page states that

ACOR delivers almost 2 million messages per week to the almost 70,000 people who subscribe to one of its online groups (Association of Cancer On-line Resources, 2000). Memberships in the various groups range from about 25 people in the smaller groups to almost 2000 individuals in the larger groups.

Other individuals and organizations have established similar online groups covering a wide range of healthcare issues. Sometimes groups are started by individuals who have been unable to find the information and support they need in their home communities (Bliss et al., 1998). Others are started by advocacy groups interested in providing service to a particular group of people. In addition to the many public groups that have open enrollments, private groups can be established to meet the needs of a group of people associated with a specific healthcare provider or organization.

Online support groups are particularly relevant to a discussion of technology for education. In their study of the categories and themes that emerged from an analysis of the postings in an online support group for colorectal cancer, Klemm et al. (1998) found that "information giving and seeking" accounted for a major portion of the messages exchanged in the group. Han and Belcher (2001) surveyed subscribers of an online support group for parents of children with cancer and found that 76% of participants cited information giving and receiving as the main benefit of the online group. A review of the purposes and goals of several online support groups revealed education and information sharing as the reason for starting and maintaining a group.

The emphasis on information sharing in online support groups is not surprising. Many people join online support groups after they or their loved ones have been diagnosed with a serious illness. They come to the support group not only to receive reassurance and encouragement, but also to gather as much information as possible so

that they can begin to make necessary decisions about treatment. By joining an online support group, they are turning to people who know what they are going through and who can give practical advice based on real-life experience. The desire to share the most current information is commonly what brings group members together, and a discussion of new treatments and other discoveries found in the literature is commonplace (Han & Belcher, 2001).

Nurses may wish to teach their clients about the benefits of online support groups, or, if an appropriate group is not available, nurses can start an online support group of their own. Online support groups may be especially helpful to people who find it difficult to leave home because of illness or care responsibilities. Clients who are unfamiliar with online communication should be reassured that there is no pressure for them to contribute to the discussion and that many people benefit just by reading the comments of others (Klemm et al., 1998). Clients who are insecure about their ability to express themselves in written format may find it helpful to initially compose their messages using a word processor so that they can take the time to think about what they want to say and use the spelling and grammar check function to edit their remarks. Clients who are unsure if an online support group will meet their needs should be encouraged to give one a try. There are no costs involved other than the cost of being online and there are no obligations to continue. Subscribers can withdraw from a group at any time.

Online support groups have some disadvantages that should be shared with clients who are thinking about joining a group. Most people who have participated in a listserv or other type of mailing list note that the volume of messages received each day can be problematic (Han & Belcher, 2001; Klemm et al., 1998). Some lists report an average of 50 or more messages per day. Experienced users

learn to sort messages and delete the unnecessary or irrelevant ones quickly. Others find requesting that messages be sent in digest form (all messages received in a day are combined and sent in one mailing) helps control the volume of e-mails received. In any case, the daily volume of messages initially can be overwhelming and may present a problem for people with low literacy levels or for people for whom English is a second language.

Clients should also be made aware of the fact that most online groups do not have a professional facilitator. Online groups are often run by someone who is interested in the health problem being discussed either because he or she has the condition or has a family member with the healthcare problem. As a consequence, inaccurate information may be shared and problems with group dynamics may not be addressed.

Finally, note that a phone line is often critical in the home when someone is seriously ill. Because many clients will connect to the Internet via the sole phone line into their homes, time spent on the computer may be a problem. Family members cannot call into the home when the client is online reading or responding to messages. If busy phone lines become a problem, it may help to go online at the same time every day and let significant others know that the phone will be unavailable at that time.

Although this chapter classifies online support groups as part of the category of automated mailing groups, it should be noted that online support groups take many forms. Many groups use the mailing list or listserv format described here. Others use a bulletin board format where messages are posted on a site where they can be reviewed by members of the group. Still others maintain a Web site that provides many avenues for communication, including scheduled and unscheduled chats, bulletin boards, mailing lists, and electronic newsletters. Regardless of the format, online support groups provide a mechanism

for meeting the teaching and learning needs of many different client populations.

## Usenet

Another mechanism for facilitating online discussion is Usenet. Usenet is a global discussion system made up of a cooperative network of computers that distribute and archive messages posted to topic-specific electronic discussion groups called newsgroups. Although referring to Usenet newsgroups as electronic bulletin boards is technically incorrect, the analogy works well because newsgroups work in a manner similar to a bulletin board. People “post” messages to the newsgroup, and anyone who has access to a newsreader can then subscribe to the newsgroup and can read the messages that have been posted. Most Web browsers include “newsreading” software that make newsgroups accessible to large numbers of people worldwide.

There are thousands of Usenet newsgroups in existence, many of which are devoted to health topics. Similar to e-mail addresses and Web addresses (URLs), the names assigned to newsgroups follow a set of rules that define the group. A newsgroup name consists of several words or labels, each followed by a period—for example, *sci.med.diseases.lyme*. The first section of the name is the category and is the broadest label used in the newsgroup name. In the preceding example, the category “sci” indicates that this newsgroup falls under the broad category of science. Seven major categories are commonly used in Usenet newsgroup names as well as a number of alternative categories. The major categories include *comp* (computers), *misc* (miscellaneous), *sci* (science), *soc* (social or cultural), *talk* (debate-oriented), *news* (news network), and *rec* (recreation). In the example *sci.med.diseases.lyme*, each word that follows the major category “sci” narrows the focus. Therefore, this newsgroup falls under the category of science and is devoted to discussion of medical diseases—specifically, Lyme disease.

A review of the newsgroup *sci.med.diseases.lyme* revealed that it had more than 65,000 messages posted. The messages covered a variety of topics from advice on symptom control to requests for prayers for a loved one who was not doing well with the disease. A large percentage of the messages posted come from people who are either seeking information or sharing information about the disease and its treatment. Participants include people who have been diagnosed with Lyme disease, are caring for family members with the disease, or are healthcare professionals or others who were interested in the topic. Some of the subscribers are frequent contributors, whereas others are “lurkers” who log on and read messages but never post one of their own.

Usenet newsgroups are worthy of mention because, like Web sites and listservs, they are a source of health and healthcare information for both consumers and healthcare professionals. However, unlike health-related Web sites that are informational or educational in nature, newsgroups are designed to provide a venue for people to talk about health-related issues and to answer questions posted by members of the group. Therefore, the types of information found and the tone of the site are very different from those of sites on the World Wide Web. Healthcare consumers who are looking for specific information can expect to scroll through multiple messages posted to the newsgroup before finding the information they are seeking. Although the volume of messages is problematic for some, many people subscribe because they enjoy the interaction and like to read the various messages that have been posted. Unlike listservs that send newly posted messages to subscribers every day, newsgroups require that subscribers come to them whenever they want to read messages. Therefore, subscribers may be more episodic in their use of the system, which may affect the types of interactions that take place between subscribers.

Newsgroups may or may not be moderated, and the subscribers who post messages range from the very knowledgeable to the uninformed. Even moderated newsgroups that have a review mechanism in place are apt to have large numbers of messages that contain inaccurate information. The role of the newsgroup moderator is generally to keep the discussion relevant to the topic by eliminating messages that do not address the subject at hand. Moderator approval of a message simply means that the message can be posted. It does not mean that the moderator agrees with the message or that he or she has reviewed it for accuracy. Some newsgroups even use automated or “robotic moderation,” which is a program that processes messages. This type of automated system may be programmed to screen for new users, certain phrases, or duplicate messages. Messages that are flagged by the program are then reviewed by an individual. It is important to note that automated systems do not assure accuracy, as the individual reviewing messages may not be a content expert.

When assessing a client’s use of the Internet and World Wide Web, it is important to determine whether newsgroups are included in the client’s list of online resources. Although clients may find newsgroups to be a source of support and practical information, they may also be a source of misinformation. Unlike Web sites where users can be taught some simple steps to evaluate the accuracy and currency of the information presented, the nature of the types of messages posted in a newsgroup makes them much more difficult to assess. Therefore, it is important for clients to understand the need to verify the information they receive from a newsgroup either by bringing questions to the nurse or by doing further research on the Web or in a library. Nurses who work with clients in a particular area of care may find it helpful to subscribe to relevant newsgroups to discover the types of messages that are being posted. Not only will

this exercise provide the nurse with data about the types of information clients are receiving, but it will also provide insight into the kinds of issues, concerns, and unanswered questions clients may have.

### Other Forms of Online Discussion

There are many other mechanisms by which online discussion can take place. Although listservs or mailing lists and Usenet newsgroups are two of the more common approaches to online discussion, others are worthy of mention. When choosing a method for teaching or exchanging information online, it is important to consider all of the options and select the method that is most appropriate for the content to be delivered and the audience to be targeted.

*Online forums, message boards, and bulletin boards* are systems that provide a way for people to post messages for others to read and respond to. They differ from newsgroups in two important ways. First, while newsgroups are found on the Internet and use e-mail as the means by which messages are sent to the group, online forums, message boards, and bulletin boards are found on a Web site. Because users of this type of discussion board are posting directly to the discussion board rather than indirectly via e-mail, many people may find this system easier to use. Second, although most discussion board-type forums require some system of registration, users can often select a user name of their choosing and e-mail addresses are not displayed. This added privacy is a boon to many people who are reluctant to share their names and e-mail addresses with strangers. Online forums, message boards, and bulletin boards for healthcare consumers and healthcare professionals can be found on many health-related sites on the World Wide Web.

*Chat* differs from e-mail and the other electronic communication modalities previously discussed in that it provides an opportunity for online conversation to take place in real time.

Although chat conversations take the form of text rather than audio, a chat session shares many features with a telephone conference call. In both scenarios, several people from different locations participate in a conversation at the same time. Both allow people to join or leave the session as needed. However, without adequate control systems in place, both chat and teleconferences can experience a number of communication problems, such as multiple ongoing conversations, lack of focus, and periods of silence.

There are many opportunities for clients and healthcare professionals to engage in online chats related to health issues. A search of the World Wide Web will uncover a vast array of scheduled chats where a particular topic is being discussed at a given time as well as ongoing chats where people are invited to stop in at any time to ask questions or engage in conversation with whomever happens to be in the chat room. For example, an award-winning Web site called MentalHealth.Net (<http://www.mentalhealth.net>) sponsors a wide range of scheduled chats for professionals, the general public, and persons dealing with mental illness. In addition to public chat rooms, many organizations sponsor chats for their own clients or staff as a way to offer ongoing educational programs or information exchange among groups.

When leading or facilitating a chat group, it is important to plan ahead. The discussion in a chat room can move quickly, and it is very easy to get so involved in the process of chatting that the content to be covered gets lost or forgotten. The following suggestions may help to organize a successful chat session:

- E-mail or post the purpose of the chat session several days in advance. If appropriate, include an agenda, assignments to be completed ahead of time, or other resources that participants will need to prepare for the session.
- Make a list of the discussion points to be covered during the session. The list should be well organized, easy to follow, and placed so that it can be easily seen during the chat. Chat sessions often move so quickly that there is little time for the facilitator to make sense of crumpled or scribbled notes.
- Depending on the topic and the experience of the facilitator, it may be appropriate to limit the number of participants. The larger the group, the more difficult the challenge of running a smooth and productive online chat.
- Sign on to the chat session early and encourage participants to do so as well. You want to be able to handle unexpected problems before the session begins.
- Watch the clock. Time in a busy chat session goes by quickly. If the chat was designed as a question and answer period, it may be helpful to ask people to e-mail important questions ahead of time so they are not forgotten.
- Help the group to follow the conversation taking place. It is easy for chat discussions to become disjointed or off-topic. When responding to a question, refer to the query and the person asking it—for example, “Karen asked about pain management. I think. . . .” If the group is losing focus, bring the participants back to the agenda and the points being discussed.
- Limit the amount of time spent discussing the detailed questions or concerns of one participant. If someone in the group needs individualized attention, suggest that they e-mail or call you after the chat has ended.
- If appropriate, ask participants who have not participated if they have any questions. Some participants choose not to make comments during a chat, which is acceptable. However, there may be others who were not quick enough to get their comments online and who have questions that need to be asked. A statement such as “Our conversation moved

very quickly tonight so I want to give those who haven't had a chance some time to ask their questions" may slow down the conversation long enough for everyone to have an opportunity to contribute.

- Begin to wrap up the session about 10 minutes before the scheduled end time. Announce that there are 10 minutes left and ask for final questions or comments.

It may also help to prepare participants for the chat experience. Chat sessions can be overwhelming for new users. The following guidelines for chat participation should be shared with clients or colleagues who will be joining a chat session for the first time:

- Allow enough time before the chat starts to download software if it is needed. First-time users are often required to download software, called a chat client, before beginning. This software is typically offered as freeware or shareware on the Internet and is easy to install.
- Be prepared to choose a user name. Participants in public chats with strangers are often advised not to use their real names so as to protect their privacy.
- Keep comments short and to the point. If a user takes a long time to compose a message, the group may have moved on to an entirely new topic by the time the message gets posted.
- Be prepared for "chat lingo" in public chat rooms. Abbreviations like BTW (by the way) and emoticons (symbols that represent emotions such as ;) = winking) are commonly used.
- Do not worry about typos and grammar. Chat programs do not have spell checks and not everyone is an experienced typist. People who are frequent chat users learn to overlook spelling errors.

Chat works well as an online communication modality for many people. Clients who

are homebound or isolated may benefit from having the opportunity to participate in education programs or to receive answers to their questions without leaving home. Likewise, many healthcare professionals would benefit from being able to access professional education that allows real-time discussion and dialogue. However, some limitations of chat must be considered. Because chat requires that people be online at the same time, scheduling conflicts and time-zone issues result in less accessibility than asynchronous forms of electronic discussion. Due to the fast pace of most chat discussions, it may be difficult for some clients to keep up with the dialogue. Clients with certain disabilities, clients who are ill, and clients with low literacy levels may find it difficult to participate if the group moves along quickly.

The future for electronic communication is exciting. The technology to add audio and video components to online conferencing is available and is becoming more refined and less expensive every day. Chat and other types of conferencing software are also becoming more sophisticated, allowing for more control and greater ease of use. It is likely that both audio and video online communication will be commonplace in the near future.

At this point in time, use of these new technologies remains limited in healthcare education for clients. Adding audio and video to electronic communication requires obtaining the hardware, software, and bandwidth necessary to support these enhancements. If we want to use technology to continue to reach clients in their homes, we need to think very carefully about cost and accessibility. The use of any technology should be based on its ability to support the goals and objectives of the learning program and should be appropriate for the widest range of users within the program's target audience (Ragan, 1999). For example, a video camera and software may cost only a few hundred dollars, but to some clients this amount is a great deal of money. Before asking our clients to purchase

this equipment, we need to weigh its cost against the benefit it will bring to the educational encounter. In the case of videoconferencing, we need to think about the cost of the equipment, the quality of the video, and ways it could be used to meet the goals of the planned educational program. We also need to consider the negative effects of denying access to clients who cannot afford the added cost. As educators, we need to identify the least expensive, easiest to use, and most accessible technology that will work for the program in mind.

### ISSUES RELATED TO THE USE OF TECHNOLOGY

Despite the power of computer and Internet technology to enhance learning, the use of these technologies in healthcare education presents some unique challenges. Think for a moment about the many ways in which healthcare education differs from more traditional classroom education. The characteristics of the learners, the setting, and the access to hardware, software, and technological support are all likely to be different. Whereas traditional classroom education is likely to take place in a structured setting, healthcare education takes place in a wide range of settings, many of which are unstructured. Students who are part of an educational system are likely to have some access to the hardware, software, and technological support necessary for facilitating technology-based learning. By comparison, access to resources and support varies considerably among healthcare consumers and in healthcare organizations. Students in a classroom also often share many common characteristics related to age and ability, whereas clients in healthcare education programs may cover a wide range of ages, abilities, and limitations. As educators, nurses must be aware of the special issues involved in the use of computer and Internet technology in healthcare education and be prepared to make accommodations as needed.

One of the most widely publicized issues related to the use of computers and Internet technology is that of the *digital divide*, or the gap between those individuals who have access to information technology resources and those who do not. As a result of the digital divide, many healthcare consumers do not have the resources necessary to gain entry to computer- and Internet-based health education programs. Thus, although technology can increase access to healthcare education for some people, educators must be aware that large segments of the population will be denied access if attempts are not made to promote “digital inclusion.” The first step in promoting digital inclusion is recognizing those groups who are at risk for limited access.

Studies conducted by the Pew Foundation and the U.S. National Telecommunication and Information Association have found that the factors determining the likelihood that someone will have access to information technology resources are age, income, race or ethnic origin, level of education, and ability (National Telecommunication and Information Association, 1999; Rainie & Packel, 2001). These studies revealed that those at risk for limited access included people older than 65, those with household incomes of less than \$35,000, African Americans and people of Hispanic descent, adults who did not complete high school, and people with disabilities. For example, the studies found that 96% of the population with household incomes higher than \$75,000 had computers and 83% had Internet access. In comparison, only 49% of people with household incomes of less than \$30,000 had computers and only 35% had Internet access (Lenhart, 2000; Rainie & Packel, 2001). People with disabilities are less than half as likely to have Internet access, and more than half of the people with disabilities in the United States report never having used a computer (National Telecommunication and Information Association, 1999). Although the

gap between computer ownership and Internet access between the white population and people of African American and Hispanic descent is diminishing, different levels of access still exist.

Lenhart (2000) categorizes the limited computer and Internet usage of people older than age 65 as the “gray gap.” A Pew Foundation study found that as few as 15% of adults over the age of 65 had access to the Internet (Rainie & Packel, 2001). Those numbers increase slightly in the 50- to 56-year-old age group, largely because many people between these ages are still in the workforce (Lenhart, 2000). Despite the statistics, it would be a mistake to discount computer-delivered education as a possibility for the senior population. Studies have found wide diversity among older adults. While some seniors report believing that there is little reason for them to go online, others are taking the initiative to learn computer and Internet skills and are joining online communities (Alder, 1996; Lenhart, 2000). Although large numbers of older adults have only limited incomes, numerous government and private initiatives are available to provide free or low-cost computer and Internet access for the senior population. While some older adults have physiologic and neurologic problems that make computer use difficult, many other seniors enjoy good health and functionality.

Health and healthcare education is important to senior citizens, and computer- and Internet-based technology holds much promise for this segment of the population. Therefore, it is important that the nurse be prepared to support computer-based learning among older clients. The following interventions may be helpful in encouraging senior citizens to engage in computer-based learning activities:

- *Reinforce principles of ergonomics by making suggestions about equipment and posture that will minimize physical problems related to computer use.* Ergonomics is important for everyone,

but is especially important for older adults who may have visual problems as well as arthritic changes in the neck, hands, and spine. Proper posture, correct positioning of the keyboard and monitor, adjusted screen colors and font size, a supportive chair, and a reminder to get up and walk around three to four times per hour will help older adults to avoid discouraging physical symptoms that may interfere with computer use.

- *Identify resources that will provide computer access and support in the senior citizen’s home community.* Supply seniors with a comprehensive resource list containing places where free computer and Internet access is available, places where computer training is provided for seniors, and contact people who will assist if problems are encountered. In addition to public libraries and community centers, numerous projects nationwide are committed to digital inclusion for all segments of the population, including the older adult population. Many of these projects and resources can be identified on the Web. For example, SeniorNet (<http://www.seniornet.org>) is an organization created for the purpose of supporting computer use among senior citizens. One of the features on the SeniorNet Web site is a state-by-state listing of places where seniors can go for computer training.
- *Motivate older adults to use a computer by helping them to identify how the computer can meet their needs.* “Older people perform best when the task is relevant to their lives” (Hendrix, 2000, p. 66). It is important to talk to seniors about their needs and abilities. Find out how they like to learn, what kinds of things they enjoy doing, and what their healthcare needs are. Matching a computer program or Web site to the individual’s unique circumstances will encourage computer use. For example, a senior who is caring for a spouse with cancer might enjoy an online support group if he or she enjoys

interacting with and learning from the experiences of others. In this way, you will help to generate interest in learning how to use a computer for health education by starting at a place that piques the senior's interest.

- *Create a supportive and nonthreatening environment to teach older adults about using a computer for health education.* Seniors did not grow up with computers and may not have confidence in their ability to learn this new skill at this point in their lives. The language of computers may seem foreign to them, so avoid jargon and define new terms. Pace your teaching according to their response. You may need to proceed slowly at first and provide opportunities for practice and for reinforcement of skills. Write the instructions down and go over them before the teaching session ends so that the senior client does not go home with unanswered questions.

Computers can open up a whole new avenue of support and information to older adults who are struggling with their own health problems and those of their partners. Seniors who enjoy good health can find resources to help them maintain their health and to become educated healthcare consumers. It is important that older adults be given the same opportunities to take advantage of the Information Age resources that are available to younger clients. The nurse can play a key role in promoting digital inclusion among this segment of the population.

People with disabilities make up another special population that may require additional planning before using technologies in health and healthcare education. Not only are people with disabilities less likely to have computer and Internet access than are members of the general population, but they may also have difficulty using hardware and software. The ability to use a computer without adaptive devices requires the fine motor coordination and mobility necessary to use a mouse and keyboard, the

strength to sit and hold the head in an upright position, and the ability to comprehend information presented on the computer screen.

For example, individuals with visual impairments may have difficulty seeing text or graphics on a computer screen or performing tasks on the computer that require hand-eye coordination. When identifying obstacles related to visual impairments, it is important to think broadly and address the wide range of conditions that affect the way we see. Color blindness, which affects approximately 8% of all males and 0.5% of females, can cause significant problems for computer users if the Web site or software used does not display the correct color combinations, if the contrast between background and foreground is inadequate, and if color rather than text is used to convey directions.

Although hearing impairments cause fewer problems for computer users than visual impairments, some accessibility issues nevertheless need to be addressed. An individual with a hearing problem may not be able to hear the sounds that are often used as prompts when a wrong key is struck or when an e-mail message is delivered. Accessibility for individuals with hearing impairments will become a bigger issue in the future when it becomes easier to send audio signals across the Web and audio messages become more commonplace.

Despite the protections offered by the Americans with Disabilities Act and other federal legislation, accessibility issues on the Web and constraints with hardware and software persist. For example, many of the learning platforms used to deliver online courses are inaccessible to people with visual impairments. Federal legislation outlined in Section 508 of the Workforce Investment Act requires government agencies and institutions receiving government funding to make their Web sites accessible to people with disabilities. To date, only a small percentage of the required Web sites accommodate the disabled or have

been approved by disability organizations (West, 2000).

Chapter 9 describes potential barriers and specific adaptations that can be employed to assist people who have disabilities to use computers. Nurses who use the Internet and the World Wide Web to teach also need to consider Web site design when creating or selecting Web sites that might be used by disabled learners. The World Wide Web contains multiple resources that can be used by Web designers or Web users to learn design principles for accessibility. For example, inserting the search command “color blindness” on a search engine will produce Web sites that explain color blindness, illustrate how various types of color blindness affect what might be seen on a Web site, describe good Web design principles for promoting accessibility, and provide tools that can be used to select color combinations that will not create barriers for individuals with color blindness.

One Web site of particular note is a site created by the Center for Applied Special Technology (CAST). CAST provides a free service called “Bobby” to assist Web page authors to identify and correct problems that could make their sites inaccessible to individuals with disabilities. Information on how to use Bobby, along with a database of approved Web sites, can be found at the Bobby Web site at <http://www.cast.org/bobby/>. Web developers who use Bobby to diagnose Web site problems and follow through by making the suggested revisions are encouraged to display a “Bobby Approved” icon on their sites. When searching the Web for sites to be used with clients, “Bobby Approved” sites should be given special consideration. However, it is important to keep in mind that Bobby approval is on the “honor system,” as CAST does not have the resources to check for Web sites displaying the icon fraudulently.

## PROFESSIONAL EDUCATION

From work-site training to higher education, technology is making professional education more accessible and more meaningful for

nurses. It is no longer necessary for nurses to quit working or to relocate to earn a higher degree. Technology has contributed to the growth of distance education programs at all levels in nursing. Likewise, technology is making it possible for nurses in the workplace to engage in a variety of educational activities designed to keep their practice current, to provide career mobility, and to enhance professional development.

### E-Learning

Technology has had such an impact on workforce training that it has given birth to a new industry and a new set of buzz words that define an Information Age approach to staff education. Professional development and training organizations have capitalized on the power of computer technology to provide businesses with learning solutions referred to as *e-learning*, an abbreviation for electronic learning. A study involving 300 interviews with representatives of business organizations in the United States and Canada revealed that more than 94% of the organizations were aware of e-learning, almost 50% had already implemented it, and another 33% had plans to do so within the next three years (Sofres, 2001). The survey also found that almost all of the organizations indicated that they had met or exceeded the benefits they anticipated as a result of implementing e-learning within their organizations.

Although no consensus of opinion has been reached on a precise definition for the term *e-learning*, there is some agreement that it involves the use of technology-based tools and processes to provide for customized learning anytime or anywhere. The emphasis in e-learning is on outcomes, with the goal of providing an individual with the information or practice opportunities required to perform a task or solve a problem at the point of need. E-learning has been well received in health care because it is cost-effective, promotes positive patient outcomes, and leads to greater staff satisfaction. The nature of the work of health

care makes workforce training a critical issue, and e-learning appears to have provided a solution to the problem of keeping staff current in a world where new treatments and new techniques are always on the horizon.

What is the e-learning approach to workforce training in health care? First and foremost, e-learning provides learning opportunities at the point of need. In health care, this statement means that training is available 24 hours a day, 7 days a week. Because the point of need in health care is often related to patient care, e-learning must be structured in a way that it can be delivered on a clinical unit. Point-of-need training must also be efficient. In this era of nursing shortages and increasing complexity of care, such training must be provided in a way that it fits into the schedules of busy healthcare workers. Finally, e-learning in health care must be distributed so that it can be made available to people across any number of environments and situations. Many healthcare organizations have staff in a wide range of settings and locations. A centralized approach to training will not work well if it means that people have to travel to the staff education office for all training programs. However, it should be noted that most organizations view e-learning as a complement to traditional instructor-led training, rather than as a replacement for it (Sofres, 2001).

Multiple approaches to e-learning in health care are possible. Examples of some of the features of e-learning products that have proved attractive to healthcare organizations follow:

- E-learning training modules can be delivered via the World Wide Web. Web-based products are attractive because they are easily accessed in a variety of environments and situations. A computer workstation can easily fit into a clinical unit, and laptops can be carried into the field.
- E-learning can be delivered in small modules that can be completed in as little as 15 minutes. Many healthcare workers are unable to leave their work area for long periods of time. However, most can find 15–30 minutes in a given day, particularly if they do not have to leave the unit. Time permitting, staff can complete several modules in one sitting.
- E-learning programs can be customized at a variety of levels: the organization, the staff position, and the individual. Customization personalizes the program and helps to make it relevant to the individual and to the organization.
- E-learning programs can track completion and create a performance report for individual staff members.
- E-learning modules are interactive and reality-based. For example, a patient simulation can be created that allows the participant to manage the care of a virtual patient.

Nurses have many potential roles in the development and implementation of an e-learning program within an institution. As content experts, they may be hired by e-learning companies to create products designed to meet the needs of practicing nurses. Nurses within a healthcare organization may be in a position to work with the e-learning company by customizing the training package purchased and developing a plan for its implementation. Those who use the e-learning system can contribute to the program by completing the modules offered and submitting carefully thought-out evaluations of the products used. Staff training programs are important to the individual staff members, to the organization, and to the patients served. Every staff member has a responsibility to do what he or she can to ensure the success of the program.

### Distance Education

As a result of technological advances, distance education for nurses is flourishing in the twenty-first century (Potempa et al., 2001). This success was not always the case, how-

ever. When distance education programs were first introduced, they were quite controversial. For example, when the Regents External Degree Program was first created 30 years ago, many people felt that a distance model was inappropriate for nursing education. Today, the Regents External Degree Program, now Excelsior College, is one of the largest nursing programs in the world, with more than 11,000 nursing students enrolled in its associate, baccalaureate, and master's degree programs. Not only has the Excelsior program grown, but it has since been joined by countless other colleges and universities that offer a variety of distance education options for nurses seeking a college degree. In 1994, another milestone was reached in nursing education when Duquesne University in Pennsylvania opened the first online distance education program leading to a Ph.D. in nursing. With the opening of the Duquesne program, we now have a full range of distance options for nurses from the associate degree through the doctorate as well as post-baccalaureate and post-master's certificate programs in a number of specialty practice areas.

The term *distance learning* means different things to different people. Online courses, correspondence courses, independent study, and videoconferencing are just a few of the techniques that can be used to deliver education to students studying at a distance. The diversity of distance education programs in the United States reflects the myriad approaches that can be used to meet the needs of students who are separated from the traditional classroom setting. In all cases, distance education means that the teacher and the learner are separated from one another (American Association of Colleges of Nursing Task Force on Distance Technology and Nursing Education, 1999).

Although many methods are used to provide courses to students who are not in the same location as the teacher, online courses are growing at such a rapid pace that the

Internet is becoming the primary vehicle for delivering distance education (Institute for Higher Education Policy, 2000). Some nursing programs are totally Internet-based, whereas others use a combination of on-site and Internet-based courses. Some nursing programs even include individual courses that incorporate a mix of classroom instruction and online discussion. It should be noted that online education is not restricted to higher education. Online continuing education programs are also available to nurses from a variety of sources.

Research has shown that distance education provides much more than a flexible approach to learning. Comparisons of students from distance education courses and from traditional classrooms have repeatedly found no significant difference in learning outcomes in these two settings (Russell, 1998). However, because distance education and particularly online education are still relatively new phenomena, the education community is still working hard to meet the many challenges associated with educating students who live and work at a distance. Several education organizations have developed guidelines and standards for distance education to assist faculty and to ensure program quality, including the American Council on Education, the National Education Association, the Commission on Higher Education of the Middle States Association of Colleges and Schools, and the Western Cooperative for Education Telecommunication (Institute for Higher Education Policy, 2000). Recognizing that distance education involves more than providing coursework, colleges and universities are also attempting to provide the support services necessary to ensure the success of the distance learner. For example, they are establishing online bookstores, online registration processes, virtual libraries, virtual student lounges, and online office hours with faculty.

Given the growth and development of online courses, it is likely that this teaching methodology will be incorporated into health and healthcare education as well. Nurses who are responsible for providing education for clients need to begin thinking about how online courses may fit into their programs.

Online courses not only provide learning activities and resources, but also facilitate teacher–learner and learner–learner interactions. Internet-based courses might work very well in areas such as parenting and diabetes education where there is an extended program of instruction and the need for group support.

## SUMMARY

This chapter focused on Information Age technology and its use in healthcare education. Specifically, the chapter discussed ways in which the World Wide Web and the Internet could be used by nurse educators to enhance health and healthcare education for consumers and healthcare professionals. The impact of technology on teachers and learners was addressed and special considerations for older adults and other client groups were identified. Trends in distance education for nurses were also explored.

Information Age technology has the potential to transform health and healthcare education. This powerful tool must be used

thoughtfully and carefully, however. Education is about learning, not about technology. Technology is merely an enhancement, a vehicle to deliver educational programs and to promote learning. The benefits of technology-based education are numerous, as are the challenges for educators and learners. As nurses, we have a responsibility to learn to use this new tool to promote health in our clients and professional growth and development in ourselves. The future for health education looks very bright, and we can help to shape it by continuing to think creatively about how to use technology in education and by participating in research about its effectiveness.

## REVIEW QUESTIONS

1. What is the “Information Age” and how has it influenced education in general, healthcare education specifically, and healthcare consumers?
2. What Information Age skills are required by healthcare professionals and healthcare consumers?
3. Describe various standards that have been established to ensure quality on the World Wide Web and access by special populations?
4. What are the ways in which resources on the World Wide Web can be used as a health information resource for healthcare consumers and healthcare professionals?
5. What are the various ways in which the Internet can be used to facilitate electronic communication between and among nurse educators and healthcare consumers? What are the advantages and disadvantages of each?
6. When using computer resources with clients, which segments of the population require special considerations due to limited access or special needs? What are those considerations and how can they be addressed?
7. What is e-learning and what advantages does it offer in providing training in healthcare settings?
8. How has technology influenced professional and continuing education options for nurses?

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