

## CHAPTER 13

# Technology in Education

Deborah L. Sopczyk

### CHAPTER HIGHLIGHTS

---

#### 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

---

Information Age

consumer informatics

World Wide Web

Internet

information literacy

computer literacy

digital divide

e-learning

distance learning

### OBJECTIVES

---

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 intermediate 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 Gruber, 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. *Bandaids 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. *Bandaids 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 *Bandaids 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-