

EDITORIAL

Health education and the digital divide: building bridges and filling chasms

Information technologies, such as personal computers and the Internet, are revolutionizing the way that people communicate, learn, and exchange goods and services. In the near future, information technologies also may revolutionize the way people promote and protect their health. More than any other communication medium or health-related technology, the Internet has the greatest potential to promote health and prevent disease for individuals and communities throughout the world. Extensive research will be required, however, to maximize positive health effects of the Internet while minimizing potentially dangerous side effects. In recognition of its tremendous potential and to further encourage new empirical research, *Health Education Research* will devote an upcoming Special Issue to the topic of health education and the Internet (see the Call for Papers in this issue).

The growth of the Internet has been unparalleled. Rogers (Rogers, 2000) recently noted that, in industrialized nations, the rate of adoption of the Internet might represent the fastest rate of adoption of any innovation in the history of humankind. It is estimated that every day in March 2000, 150 000 new users logged onto the Internet, 200 000 new devices were connected to the Internet and 2 000 000 new web pages were added to the Internet throughout the world (United Nations, 2000). Despite this amazing growth, all of the current Internet users combined still represent less than 5% of the world's population (United Nations, 2000).

Today's Internet users already seek information online to help make more informed decisions about their healthcare needs (White House Office of the Press Secretary, 2000). One recent survey of adult Internet users in the US found that 62% have looked up information on treating a disease for themselves or a family member, 57% sought information on medicines or prescription drugs,

52% looked for ways to prevent illness and 44% looked at information on their diet, exercise or appearance (National Public Radio, 2000).

As a medium, the Internet seems uniquely suited for health education and promotion because it can be used as a tool within our existing models and frameworks without sacrificing our principals and values. For example, individual Internet users can seek out extensive health information on virtually any topic, all the while controlling the process and the flow of information. In the near future, individuals may be able to use the Internet to communicate with their healthcare providers, engage in complex behavior change programs, manage chronic illnesses, and receive comprehensive health information that is tailored to their health needs, personal characteristics and preferences.

The Internet also can be a powerful and appropriate tool for health education beyond the individual level. Consider, for example, the other four levels of analysis described in the Social Ecological Model for Health Promotion (McLeroy *et al.*, 1988). At the interpersonal level, groups of people can use the Internet to communicate with each other, build social relationships and provide each other with social support. Organizations can use the Internet to solicit input and involvement in health promotion programs, and to speed their diffusion and adoption. Communities can use the Internet to organize, advocate for themselves, and create their own content and tell their own stories. In this way, the Internet can help preserve cultural heritages and disseminate them globally (Larson, 2000). At the public policy level, the Internet can help build open societies, foster the spread of democracy and respect for human rights, and hinder corruption (Center for Democracy & Technology, 2000; Larson, 2000).

Although the Internet offers great promise for health education and promotion, there also are potential risks. These risks may include, but are not limited to, misappropriation of limited resources, violations of privacy and confidentiality (Science Panel on Interactive Communication and Health, 1999), the proliferation of inaccurate or misleading

health information (Winker *et al.*, 2000), and, perhaps most importantly, lack of access to the Internet itself (Eng *et al.*, 1998).

The gulf between those who have access to information technologies and those who do not is often called 'the digital divide'. Differences in income and education levels are the leading factors that are contributing to the divide in the US, according to the third of three studies by the National Telecommunications and Information Association (US Department of Commerce, 1999). They found, for example, that urban American households with annual incomes of \$75 000 or more are 20 times more likely than rural households at the lowest income levels to have Internet access. In addition, Americans with college degrees or more education are 16 times more likely to have Internet access at home than people with some high school education. In the US, the average home Internet user is white, 33 years old, with at least some college experience and a household income of about \$67 000 (PC Data Online, 2000).

Although recent survey data suggest the digital divide in the US is primarily a function of income (Jupiter Communications, 2000), significant racial and ethnic differences continue to exist at lower income levels. Among those with low annual incomes, households of Asian/Pacific Island descent and white households are about 3 times more likely than African-American and Hispanic households to have Internet access (US Department of Commerce, 1999). The digital divide between countries from the industrial and the developing world are even more substantial and intractable. There currently are, for example, more Internet users in New York City than in the entire African continent (Larson, 2000).

The digital divide and its social implications are essentially new versions of old problems. Like other differences between the world's 'haves' and 'have nots', lack of access to information technology can have profound negative implications for one's economic, social and physical health and well-being. In the field of communications, this concept has long been known as the 'information gap'—the relative advantage of those with eco-

nomical resources to access all the information that they desire and the resulting disparity of knowledge and opportunity (Berry, 2000). Individuals and communities without functional access to the Internet and other information technology will have far fewer opportunities for economic development and wealth creation than those with access to the technology (Berger, 1999; Hohman, 1999; Lanier, 2000; United Nations, 2000).

In light of the fact that the Internet offers tremendous potential as a tool for health promotion and that lack of access to the Internet actually may widen the disparities of health and well-being for individuals, communities and entire societies, it is imperative that health education researchers and practitioners develop effective Internet-based health promotion programs while working vigilantly to increase functional access to the Internet among the most underserved communities and populations. Our efforts toward the latter goals should focus on two separate but related issues: access and content. Our guiding principal for these efforts, originally proposed by Dorothy Nyswander (Nyswander, 1956) and recently updated by Caroline Wang (Wang, 2000), should be to *start where the people are*, and to help them access information technology in a manner that is appropriate, effective and respectful of their individual and collective needs and perspectives.

The underlying economic and social reasons that many do not have access to information technology are the same reasons that so many do not have access to adequate healthcare: cost, geographic barriers, literacy, language, culture, disability, and other factors related to the ability to use services appropriately and effectively (Eng *et al.*, 1998). Additional barriers to Internet access in developing countries include inadequate telecommunications infrastructure, billing local calls by the minute, failure to attract foreign investment by privatizing state-owned telecommunications monopolies and the current lack of alternative telecommunication technologies (Center for Democracy & Technology, 2000). In other words, increasing access to the Internet is far more difficult than simply providing people with affordable computers and modems.

The ideal location for Internet access that maximizes its positive potential is to be connected from the privacy of one's home (Eng *et al.*, 1998; Hafner, 2000); however, cost and infrastructure issues often make this impossible. For example, at least 6.3 million US households still do not have telephones (Benton Foundation, 2000) and two-thirds of the world's population have never made a telephone call (Wang, 2000). Until wireless data-transfer technologies become widely available, affordable and capable of handling sufficient bandwidth, alternative strategies for providing access will be necessary.

One such approach that is gaining momentum in both industrialized and developing countries is the creation of Internet public access points (Eng *et al.*, 1998; US Department of Commerce, 1999; Carvin, 2000; Center for Democracy & Technology, 2000). Sometimes called 'community technology centers', these include places such as schools, libraries, post offices, churches, laundromats, cyber-cafes or free-standing centers where the public can get Internet access at no or low cost. However, community technology centers must be developed with the input, involvement and ownership of the local community if they ultimately are to be accepted and effectively used by the community. Time-tested health education strategies such as community diagnoses and needs assessments can help determine communities' needs, assets, characteristics and preferences regarding information technology, and techniques such as community organizing can help facilitate local ownership and involvement in the development of a center. Community technology centers also need to provide people the opportunity to express themselves, and to create their own content and presence on the Internet. It is important to remember that connecting underserved people to the Internet is not only about what the Internet can give to them, it also is about what *they* can give to the Internet and, in so doing, to the rest of the world.

Unfortunately, reducing the digital divide will require more than just increasing physical access to the technology. There are other complex reasons that people do not use the Internet that must be

addressed as well (Carvin, 2000; Cisler, 2000; Light, 2000). One important area that requires attention is expanding, updating and revamping Internet content. A recent study by The Children's Partnership found that existing content on the World Wide Web does not meet the content needs of underserved communities (Lazaras and Mora, 2000). They strongly recommend that there to be more of the following on the Internet: (1) local-oriented content, particularly about employment, education and business development opportunities; (2) information that is less text oriented and more accessible to those with lower literacy skills; (3) information that is available in multiple languages; and (4) information that is created by underserved communities themselves, and that is culturally inclusive and appropriate. These four recommendations should be used as a checklist for those developing Internet-based health education programs. Doing so can help to increase functional access to the Internet and ensure that the content is relevant and useful to the collaborating communities.

Finally, health education researchers and professionals should work in conjunction with members of governments, industry, communities, and other professional disciplines and organizations to reduce the digital divide. Only through our combined efforts and expertise can we bring the necessary resources to bear to address this global division. Such efforts to increase underserved community access to the Internet and to make content more relevant to underserved communities will help 'build the bridge' that people can cross to the other side of the digital divide. However, to truly eliminate the divide, efforts must also focus on *filling the chasm* that lies between both sides. This chasm is deep and wide, and existed long before the Internet was developed. However, with continued efforts toward reducing poverty, increasing literacy and empowering communities, we can start filling in the chasm and we can all walk across together.

Although information technology and the Internet offer great potential for health education and promotion, there will be many challenges ahead before this potential can be reached. Extensive

research and evaluation will be required to develop effective Internet-based health education programs, and to minimize potential risks and harms to receivers of Internet health information. Working to close the digital divide is but one issue that should be addressed through research and the appropriate application of health education theories, models, principles and core values. If we fail to successfully address this issue, however, existing health disparities soon may increase dramatically and those who are not connected to the Internet may be passed by, left for 'roadkill' on the information superhighway.

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