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The current and potential future roles of the Internet in the field of health education

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San Jose State University

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THE CURRENT AND POTENTIAL FUTURE ROLES OF THE INTERNET
IN THE FIELD OF HEALTH EDUCATION

A Thesis

Presented to

The Faculty of the Department of Health Sciences

San Jose State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Public Health

by

Wendy L. Boman

August 1997

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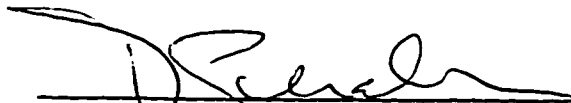
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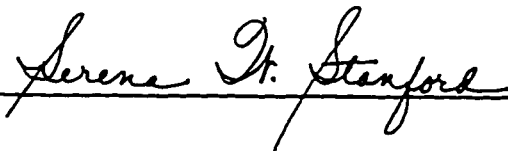
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ABSTRACT

THE CURRENT AND POTENTIAL FUTURE ROLES OF THE INTERNET IN THE FIELD OF HEALTH EDUCATION

by Wendy L. Boman

This thesis investigates the current and potential future roles of the Internet as a tool for health education professionals through an exploratory multimethod examination of the perceptions and opinions of leaders and innovators in the field. The resulting insights are analyzed and discussed within the framework of the professional dialogue regarding the directions of health education for the new millennium, and recommendations are made.

Phase I consisted of a written semistructured survey. Phase I data revealed that health educators were using the Internet as a tool for communication, collaboration, finding information, and sharing information. Phase II consisted of in-depth interviews with opinion leaders. Phase II data revealed that opinion leaders agree that the Internet will play an increasing role in health education over the next 10 years, and revealed advantages and risks to this potential future role. A validation phase was planned but was not successfully implemented.

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CHAPTER 1

INTRODUCTION

The major health education professional organizations are in the midst of strategic planning to carry the profession into the new millennium ("Executive Board," 1996; Johnson, 1995). In addition, key public health and health education organizations are developing and revising core practices, competencies, and standards to ensure a public health work force capable of providing essential services in the 21st century ("Defining Public Health Workforce," 1996). As the millennium approaches, health education professionals are facing the need to blend traditional values and processes of the past with efficient and powerful technologies of the future in order to position the field as a key public health player in the 21st century.

Increasingly, the Internet is entering into these discussions as a potential tool for meeting strategic goals and objectives ("American Public Health Association Strategic Plan," 1996; L. Stegmier, personal communication, August 9, 1996) for enhancing communication and collaboration among professionals ("Disconnected," 1996; "Internet a Promising Tool," 1996), and for translating both existing and newly developed responsibilities and competencies into practice (Capwell, 1997). Early research indicates that the use of the Internet is beginning to diffuse among public health professionals, including health educators (Kittleson, 1995; Lennon, Bernhardt & Strecher, 1995; Taub, 1995; Taylor, 1996). However, there is currently no overall vision for the role that this new technology may come to play in the field of health education, nor are its unique

capabilities completely and specifically incorporated in the objectives or methods of the associations' strategic plans and key debates.

The purpose of this formative research was to investigate the potential of the Internet as a tool for health education professionals through an exploratory examination of the perceptions and opinions of leaders and innovators in the field. The goal of this investigation was to explore the potential roles of the Internet in health education policy, research, and practice. The resulting insights were analyzed and discussed within the framework of the professional dialogue regarding the directions of health education for the new millennium.

Statement of the Problem

The Internet is the name for a network of worldwide information resources that is so vast as to have been labeled by some as "beyond comprehension" (Hahn & Stout, 1994, p. 2). This revolutionary technology evolved out of ARPANET, the first computer network ever developed. ARPANET was developed in the 1960s by the Advanced Research Projects Agency (ARPA), an independent agency for research under the United States Government Department of Defense, in collaboration with the leading universities and computer science research laboratories of the time (Hafner & Lyon, 1996). Although rumors persist that the purpose of ARPANET was to protect national security in the event of nuclear war, engineers who worked on this project from its infancy maintain that in actuality it was built as a tool to share scarce and costly computer resources and to

facilitate communication between professionals in the emerging field of computer science (Hafner & Lyon). In the 1980s, ARPANET was joined with academic and other networks to create what came to be known as the Internet (Hafner & Lyon).

What began as a tool for communicating among elite computer scientists in government and academia has become a tool for everyday communication among people of all professions. The Internet offers a range of communication and resource sharing technologies, including: electronic mail (e-mail), a system that lets people send and receive messages; listservs, where messages sent to an e-mail address are routed to everyone who has subscribed to the mailing list; bulletin board systems (BBS), services that permit one person to post a message for others to read; file transfer protocol (FTP), a tool that allows an Internet user to connect to another Internet site and copy a file onto one's own computer; and the World Wide Web (WWW), a system of organizing and publishing information on the Internet.

One characteristic of the Internet that makes it a revolutionary innovation is its accessibility to millions of people worldwide. According to the market research firm Dataquest, about 30 million people around the world have access to the Internet, a figure that is estimated to reach half a billion by the year 2000 (Hamilton, 1995). Other unique qualities of this innovation are the ability to access vast amounts of information and to do so with incredible speed.

Early adopters of this new technology in the field of health education are using the Internet for a wide variety of purposes: to advise and teach students (S. Prowse, personal

communication, October 29, 1995; A. Taub, personal communication, October 31, 1995,); to access information from medical libraries and on-line journals such as the Center for Disease Control's Morbidity and Mortality Weekly Report (J. Morris, personal communication, October 29, 1995); to create home pages (sites on the WWW) for the purpose of sharing information about the agencies they work with (D. Harris, personal communication, October 29, 1995); to send e-mail to subscribing health educators through a listserv (M. Kittleson, personal communication, October 31, 1995); to provide health education (S. Brown, personal communication, October 29, 1995); to provide and receive continuing education (R. Anderson, personal communication, October 31, 1995); and to communicate with outreach workers in developing countries (J. Mullaney, personal communication, October 31, 1995). In addition, local organizations access federal data on-line, allowing them to receive information three to six months before it would be available in a library (Lynn & Koebrick, 1995). For some organizations and critical health concerns, the ability to access new data quickly is crucial.

Although the Internet is an innovation that is still in the early stages of adoption (Howard, 1995; Lynn & Koebrick, 1995), it is a subject of great relevance to the health education profession. For example, the theme of the 1996 Society for Public Health Education (SOPHE) Midyear Scientific Meeting was "Health Education in the New Millennium: The Power of Technology and Innovation." The American Public Health Association (APHA) has recently debuted its home page on the WWW. APHA also has a newly developed Communications Task Force, whose members are debating the role that

this organization should take in regard to ensuring the integrity of health information on the Internet and training and facilitating other health professionals to use and expand the Internet's vast resources and potential.

Despite the exciting potential, critical issues have been raised by some in the field regarding the consequences of adopting Internet use as a standard of practice. Key among these concerns are the potential divisions among practitioners and communities based on access. Internet technology, while revolutionary in many aspects, remains beyond the means of many individuals and organizations. One of the adverse consequences of the spread of Internet use may be a phenomenon called *information redlining*, defined as "the threat that low-income, minority, and rural communities will be excluded from the deployment of information technology" if the cost barriers to Internet access are not addressed (Bauman Foundation, 1995, p. ix). Other concerns focus on the quality assurance of health information from the Internet, proliferation of non-credentialed or unqualified health educators, and the loss of the profession's emphasis on interpersonal communication.

However, if cost and other barriers were overcome, many argue that Internet technology could have the powerful potential to foster and facilitate communication and collaboration. It could expand the sphere of interaction and influence of health educators, and foster a sense of global community. In an editorial in the *British Medical Journal* (1994), LaPorte states that

new technology can vastly improve the accumulation and dissemination of information on public health. . . . Moreover, much of public health and prevention depends on the transfer of information, which telecommunication systems provide very cost effectively. . . . Given the technology that is readily available, we could inaugurate a global health information infrastructure to improve health worldwide. (p. 1651)

As noted by Thomas (1992), the potential is just as great for organizing communities as it is for organizing ourselves:

Health educators working to involve community members in community organization, social change, or social policy interventions are also making extensive use of computers: to network with each other, to communicate with decision and policy makers, and to download data useful to their cause. (p. 279)

Early adopters of this new technology are forming key systems, known as linkage systems (Havelock, 1971), which are critical for the successful diffusion of any new idea or technology. Linkage systems are comprised of the collaborative activities of representatives of the resource system (the system from which the innovation originated) and representatives of the user system (the intended adopters) that facilitate the adoption process (Kolbe & Iverson, 1981). The linkage system serves to foster the capacity of the user system to successfully adopt an innovation through planning for the innovation and providing information, training, technical support, and access to outside resources (Havelock).

The linkage system that is developing around the diffusion of Internet technologies will be particularly important in the success of this innovation. Because of the decentralized nature of the Internet, it is actually created, revised, and improved by its users. However, there exists a large gap in knowledge and expertise between the computer experts in the resource system and health educators in the user system. A strong set of people who can communicate with both systems will be necessary to bridge this information gap.

Because of the enormous potential of, and yet serious obstacles to, the diffusion of the Internet among health education professionals, the role of this technology in the future of health education deserves close examination. The results of such a closer look could facilitate moving health education along the strategic directions and into the new millennium, while the implications of not examining the potential of this new technology could hinder the profession's capacity, and even viability, in the future. The time for health education to position itself as a key player in the 21st century is now. The strengths of the profession can be used to carve out new roles and relationships, move the profession forward into a new role, and shape the way that health is construed and enhanced, if work is done within the profession to become positioned and prepared. Otherwise, instead of being an integral part of these changes, health education will get left behind and will instead be shaped by the changes.

This research was designed to address the following research questions:

1. How are health educators currently using the Internet?
2. What are the perceptions of health education opinion leaders and early Internet adopters regarding the potential short- and long-term roles of the Internet in health education policy, research, and practice?

Research Objectives

This research was designed to meet the following objectives:

1. To describe how the Internet is currently being used within the field of health education.
2. To explore the potential roles of the Internet in the field of health education and the perceived benefits, risks, and barriers to using this new technology.
3. To analyze the data within the context of formal dialogue and planning currently taking place among health educators regarding the strategic directions of the profession.
4. To generate data which can be used by health education organizations, including professional organizations and academic preparation programs, to develop recommendations for using the Internet to meet strategic planning goals.
5. To contribute to the literature on diffusion of innovations, the Internet, and the future directions of health education.

6. To stimulate awareness and discussion of the potential of the Internet in the future directions of the field of health education.

Research Procedures

Conceptual Framework

The research questions were studied within the conceptual framework of diffusion theory (Rogers, 1962). The data were analyzed with a focus on the linkage system (Havelock, 1971).

Diffusion theory explains the communication process that takes place when innovations are introduced to and adopted (or not adopted) by a population. The roots of this theory are in agricultural sociology, where it was used to explain how new agricultural technologies spread, or failed to spread, among farmers (Rogers, 1983).

Diffusion research has now been conducted within many disciplines. In the field of public health, it has been most widely used to study the spread of family planning methods in developing countries (Rogers, 1995). Diffusion research has also been used to explain the adoption of technological innovations within organizations (Pennings & Buitendam, 1987).

In the classical approach to diffusion of innovations, the innovation is seen as originating from a resource system, which is comprised of the researchers, developers, and technical experts, and diffusing into a user system, which consists of the individuals and agencies who will ultimately adopt, or fail to adopt, the innovation. Communication

is traced in a unidirectional flow from the resource system to the user system. This approach has been criticized as it does not allow for the study of the contributions that each system may make in both influencing diffusion and adapting the innovation to the user group as it is adopted, therefore overcoming many of the possible barriers to adoption (Orlandi, Landers, Weston, & Haley, 1990).

The diffusion framework has been expanded through inclusion of a more interactive component called the linkage system (Havelock, 1971). This crucial but informal system represents the cooperative exchanges and interactions required to collaboratively develop user-relevant innovation and diffusion strategies (Havelock, 1971).

Opinion leaders are more likely than other members of the innovation's intended population to be at the center of interpersonal communication networks within the population. They are also more likely to be exposed to numerous forms of external communication, making them key elements in the linkage system (Rogers, 1983). These opinion leaders are often early adopters and thus have expert knowledge of both the technology and insider knowledge of the user system (Rogers, 1983).

Methods

This exploratory study surveyed health education professionals who were opinion leaders, early adopters of Internet technologies, or both. The methodology was based on three triangulated, sequential components incorporating principles of qualitative research.

Specifically, the study was designed to explore the potential roles of the Internet in health education policy, research, and practice, and the perceived benefits, disadvantages, and barriers created by utilizing this new technology. The resulting insights were framed in the context of key issues arising out of formal dialogues and planning for the strategic directions of health education as a profession.

Phase I: How Health Educators Use the Internet

The first phase of this study was a cross-sectional survey of health education professionals who were innovators or early adopters of the Internet. This written, semistructured survey was designed to identify and describe how health educators were using the Internet, identify opinion leaders for the second phase of this research, and gather demographic data needed for the purposive sampling in the second and third phases.

The Phase I survey sample was created by means of snowball sampling. A core of 17 subjectively identified innovators and early adopters within this field was created through attending Internet-related sessions at the 1995 annual meetings of

SOPHE and APHA in San Diego, California, and the 1996 SOPHE Midyear Scientific Meeting in West Chester, Pennsylvania.

Surveys were sent to the 17 core members, who were asked to identify other health educators they knew of who were using the Internet. Surveys were then sent to these health educators referred by the core sample, along with those identified through a posting to a health education listserv. This procedure was designed to be repeated until either the total Phase I sampling goal of 75 to 125 completed questionnaires, or the point of saturation, had been reached.

The Phase I survey instrument was created using pre-existing scale questions along with categorical and open-ended questions developed by the researcher. The scale questions were adapted from a set of general scale items, applicable to any innovation, measuring eight attributes of innovations (Moore & Benbasat, 1991). The survey also included original categorical questions pertaining to demographics and adoption category, and open-ended questions addressing participants' experiences with using the Internet.

Quantitative data were entered into Epi Info Statistical Software for Microcomputers and analyzed for measures of central tendency. Qualitative data were entered into Microsoft Word for Windows and analyzed for content, insight, and emergent themes.

Opinion leaders identified by survey respondents were coded for area of opinion leadership (health education, Internet, or both), arena of practice, age, gender, geographic

location, and years in practice,. This information provided categories for the purposive sampling in Phase II.

Phase II: The Potential Roles of the Internet

The second phase of this study consisted of semistructured phone and personal interviews with purposively selected opinion leaders. The purpose of this phase was to explore the potential roles of the Internet in the field of health education, as well as the perceived benefits, risks, and barriers to using this new technology.

The Phase II sample was purposively selected from the population of opinion leaders identified in Phase I, together with additional opinion leaders identified by the researcher. The purposive sampling was based on both pre-set criteria and protocols for eligibility that were determined based on comparisons that emerged during data analysis. Pre-set criteria included demographic measures such as age, gender, geographical location, years in practice, and arena of practice. The final Phase II sampling goal was 20 to 30 completed interviews, based on the quality of the interviews, the purposive criteria, and the point of saturation.

The semistructured interviews followed an interview guide consisting of open-ended questions regarding the participants' perceptions of the potential roles of the Internet in health education, and the potential positive and negative outcomes of those roles. The interview guide also contained questions to encourage participants to frame

these potentials within the context of the current strategic directions of health education.

Notes were taken on these interviews and analyzed for emerging themes.

Phase III: Validation

The third phase in this research was designed to consist of a focus group, an on-line chat group session, or both, with purposively selected opinion leaders. The purpose of this final phase was to validate the research findings and interpretations.

A sample of opinion leaders who were identified in Phase I and were interviewed in Phase II was purposively selected based on criteria that emerged after analysis of the data had begun. Eligible participants were invited to participate in an on-line chat group session with other opinion leaders. The sampling goal was six to ten participants.

A list of questions was developed to help guide the discussion. Questions were kept purposefully vague to avoid forcing the participants into validation of the findings. The data were to be coded for themes and analyzed for validation or non-validation of findings.

Definitions

The following definitions were used in this study:

Compatibility Conceptual: The degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters (Rogers, 1983).

Operational: Participants' responses to questions 16 and 17 on the Phase I survey (see Appendix E).

Complexity Conceptual: The degree to which an innovation is perceived as difficult to understand and use (Rogers, 1983).

Operational: Participants' responses to questions 20 and 21 on the Phase I survey (see Appendix E).

Diffusion Conceptual: The process by which an innovation is communicated through certain channels over time among the members of a social system (Rogers, 1962).

Early adopter Conceptual: Individuals comprising the second adopter category, the classification of members of a social system on the basis of innovativeness. After innovators, early adopters are the next 13.5% of the individuals in a system to adopt an innovation (Rogers, 1983).

Operational: A health educator who self-identifies as an early adopter of the Internet or who self-identifies as a current user of any Internet application, as measured by the responses to questions 27 and 28 on the Phase I survey (see Appendix E).

Health education Conceptual: Any combination of learning experiences designed to facilitate voluntary actions conducive to the health of individuals, groups, or communities (Green, 1990).

Health education professionals Conceptual: Individuals working in the field of health education.

Operational: Individuals who self-identify as working in health education, as measured by the response to question 32 on the Phase I survey (see Appendix E).

Innovation Conceptual: An idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 1962).

Innovator	<p><u>Conceptual</u>: Individuals comprising the first adopter category, the classification of members of a social system on the basis of innovativeness. Innovators are the first 2.5% of the individuals in a system to adopt an innovation (Rogers, 1983).</p> <p><u>Operational</u>: A health educator who self-identifies as an innovator in regards to the Internet, as measured by the responses to questions 27 and 28 on the Phase I survey (see Appendix E).</p>
Internet	<p><u>Conceptual</u>: The public, federally subsidized network that is made up of many linked networks all running TCP/IP protocols (Hafner & Lyon, 1996).</p> <p><u>Operational</u>: Any of the different applications for accessing and/or publishing information via the Internet, including but not limited to search tools such as Gopher, the WWW, e-mail, telnet, and file transfer protocol (FTP), and including non-Internet on-line applications with gateways to the Internet, including but not limited to commercial and subscription on-line services.</p>
Linkage system	<p><u>Conceptual</u>: The system in which cooperative exchanges and interactions required to collaboratively develop useful innovations and diffusion strategies occur between the resource system (technical experts) and the user system (end users) (Orlandi et al., 1990).</p> <p><u>Operational</u>: Health education and other professionals with knowledge of and expertise with the Internet who act as liaisons between the technical experts (resource system) and other health education professionals (user system).</p>
Observability	<p><u>Conceptual</u>: The degree to which the results of an innovation are visible to others (Rogers, 1983).</p> <p><u>Operational</u>: Participants' responses to questions 22 and 23 on the Phase I survey (see Appendix E).</p>

Opinion leader	<p><u>Conceptual:</u> An individual who informally influences other individuals' attitudes or behavior by providing information and advice about innovations to others in their system (Rogers & Shoemaker, 1971).</p> <p><u>Operational:</u> A health education professional who has been referenced at least twice by a colleague as being an opinion leader in the field of health education or an opinion leader with regards to the Internet, or who has been referenced by a colleague at least once and who has been the author or presenter of at least one article or conference session on the Internet.</p>
Professional organization	<p><u>Conceptual:</u> An association or society formed by individuals who have completed a prescribed curriculum and training and have met standards of certification with the purpose of upholding professional standards and better serving society through their united efforts (Green, 1990).</p> <p><u>Operational:</u> A formal, recognized association, either national or local, partially or entirely devoted to the interests of health education, including APHA, state public health associations, SOPHE, local SOPHE chapters, the Association for the Advancement of Health Education (AAHE), the Association of State and Territorial Directors of Health Promotion and Public Health Education (ASTDHPPE), and the National Coalition of Health Education Organizations (NCHEO).</p>
Relative advantage	<p><u>Conceptual:</u> The degree to which an innovation is perceived as being better than the idea it supersedes (Rogers, 1983).</p> <p><u>Operational:</u> Participants' responses to questions 12 through 15 on the Phase I survey (see Appendix E).</p>
Strategic planning	<p><u>Conceptual:</u> A disciplined effort to produce fundamental decisions and actions that shape and guide what an organization is, what it does, and why it does it (Bryson, 1995).</p>

Operational: Strategic planning initiatives, revision of core practices and competencies, refining of the credentialing process, and development of graduate standards for health education.

Trialability

Conceptual: The degree to which an innovation may be experimented with on a limited basis (Rogers, 1983).

Operational: Participants' responses to questions 25 and 26 on the Phase I survey (see Appendix E).

Limitations

Several limitations were identified in the design of this research prior to data collection. Awareness of these limitations enabled the researcher to be particularly careful in the use of purposive sampling and other qualitative research techniques.

One of the primary limitations of diffusion research is the pro-innovation bias. This bias has been described as the assumptions in diffusion research that an innovation should be diffused and adopted by all members of the system; that it should be diffused more rapidly; and that the innovation should not be rejected or re-innovated (Rogers & Shoemaker, 1971). The selection of opinion leaders as defined in the sampling protocol reinforced this inherent bias. Awareness of this limitation served as a sensitizing concept for this research and, as such, was taken into account when analyzing the data and developing recommendations.

An additional limitation of this research lies in the fact that the recommendations will become less significant as the diffusion of the Internet as an innovation reaches the top of the adoption curve. As the number of people within a population who have adopted

an innovation reaches the point of critical mass, the innovation is sure to diffuse successfully. If the Internet were to reach this point, recommendations for its successful diffusion will no longer be necessary. However, it is almost certain that the Internet will not be the last new technology to diffuse among health educators. The findings and recommendations of this study may be applicable to other technological diffusions in the field of health education.

The limitations of the methodologies used in this research include the lack of generalizability due to the use of a nonrandom sample and the use of health education professionals to identify opinion leaders, which may introduce a selection bias driven by personal networks and interactions.

Significance

The findings of this research are useful and important in understanding the diffusion of the Internet and describing the current and potential future applications of this new technology within the context of the strategic directions of health education as a profession. Since the findings supported this innovation as advantageous, this research should be of use in designing programs to encourage the adoption of the Internet among health education professionals and in training them to use this technology. The research has also identified barriers and suggested ways for overcoming them that will be important in the development of future programs and protocols designed to increase adoption of the Internet while preventing information redlining.

This research also contributes to the body of literature on diffusion theory and the linkage approach. This is a unique contribution because the Internet is different from many previous innovations in that it is developing and diffusing at the same time.

CHAPTER 2

LITERATURE REVIEW

This chapter introduces and discusses the Internet, the topic of this research; the profession of health educators, the population under study; diffusion of innovations, the conceptual framework underlying this research; and exploratory multimethods based on qualitative research, the methods used in this study. The history of the Internet's development is examined in order to reveal its roots in collaboration and information sharing. The emerging and evolving role of the Internet in public health and health education is discussed, along with the potential barriers to succeeding in this role. The profession of health education is discussed within the context of key discussions that are occurring in order to position the profession as a key player in public health in the coming century. The conceptual framework of this research is examined and the methods used in this research are discussed.

The Internet

"The best way to understand the Internet is not by its technology but by its potential for communication" (Cady & McGregor, 1996, p. xxxvi).

The history of the Internet reveals its roots in collaboration and information sharing and the beginning of its diffusion into the non-computer science fields. This

examination of the history, current roles, and future potential of the Internet is important in understanding the role that it may come to play within the field of health education.

The History of the Development of the Internet

The Internet is the name for a network of worldwide information resources that is so vast as to have been labeled by some as “beyond comprehension” (Hahn & Stout, 1994, p. 2). This revolutionary technology evolved out of ARPANET, the first computer network ever developed. ARPANET was developed in the 1960s by the Advanced Research Projects Agency (ARPA), an independent agency for research under the United States Government Department of Defense, in collaboration with the leading universities and computer science research laboratories of the time (Hafner & Lyon, 1996). ARPA was formed by President Eisenhower in the period of national crisis following the Soviet launch of the first *Sputnik* satellite in 1957. The purpose of this office was to ensure that the United States would never again be taken by surprise on the technological frontier. Although rumors persist that ARPANET’s purpose was to protect national security in the event of nuclear war, engineers who worked on this project from its infancy maintain that in actuality it was built as a tool to share scarce and costly computer resources and to facilitate communication between professionals in the emerging field of computer science (Hafner & Lyon, 1996).

By the late 1970s, computer science was a booming field and the advantages of sharing expensive computing resources and emerging programming knowledge via

ARPANET had become clear. However, ARPANET could only be used by researchers working in defense-related research. Indeed, research institutions without access to the network were at a disadvantage for attracting contracts, faculty, and students (Hafner & Lyon, 1996).

In 1980, the National Science Foundation (NSF) granted a proposal by computer scientists at several universities to establish a new network called CSNET (Computer Science Network). CSNET would be a network of universities and would include links known as *gateways* joining it with ARPANET. The NSF agreed to support this new network for a five year startup period, after which it was to be fully funded by user fees (Cady & McGregor, 1996).

By the mid 1980s, CSNET had become successful and self-sufficient, and more networks began to emerge, both within and outside of the United States. Computer scientists had spread the word about the usefulness of networks to their colleagues in medicine, arts, and the humanities, and demand for new network connections grew rapidly (Cady & McGregor, 1996). Because this growing conglomeration of networks communicated using the same protocols and contained gateways to one another, the distinctions between them began to dissolve. This loose matrix of interconnected worldwide networks came to be known as the Internet (Hafner & Lyon, 1996).

The Internet Today

“The Net promised to be to the twenty-first century what the telephone had been to the twentieth” (Hafner & Lyon, 1996, p. 257).

What began as a tool for communicating among elite computer scientists in government and academia has become a tool for everyday communication among people of all professions. In 1990, the WWW was created, and the Mosaic browser, a graphics program that made the WWW easier to use, was developed in 1993. The National Science Foundation, which had funded a large portion of the development of the Internet, lifted restrictions against commercial use of the Internet in 1991, and usage began to increase rapidly (Hafner & Lyon, 1996).

The Internet now offers a range of communication and resource sharing technologies, including: e-mail, a system that lets people send and receive messages; listservs, where messages sent to an e-mail address are routed to everyone who has subscribed to the mailing list; bulletin board systems (BBS), services that permit one person to post a message for others to read; file transfer protocol (FTP), a tool that allows an Internet user to connect to another Internet site and copy a file onto one's own computer; Usenet and other newsgroups, over 9000 sets of topically related articles that people can read and respond to; Internet Relay Chat (IRC) and its derivatives, which allow Internet users to converse with each other in real time; and the WWW, a system of organizing and publishing information on the Internet.

New Internet technologies are becoming available and increasingly accessible with incredible speed. Internet users can purchase software that allows them to publish information on the WWW without having to learn programming codes. In addition, the technology exists to broadcast real-time audio and video images via the Internet.

Individuals, small businesses, and corporations alike are expanding their spheres of influence as this low-cost, far-reaching marketing and communications tool evolves. For instance, both Fortune 500 companies and small businesses have published WWW sites which provide information about their companies to Internet users world wide. Radio stations are no longer bound by the physical limitations of sound waves as they broadcast their radio shows live on the World Wide Web.

The borders between different kinds of computer and media technologies continue to blur. Sony has recently released Web TV, and for around \$350, anyone with a television and a phone line can hook up to the Internet to explore the Web and send and receive e-mail. Commercial on-line services, such as America Online and CompuServe, long kept separate from the Internet, are increasingly offering the same unrestricted low-cost direct links to the Internet that were formerly available only through direct Internet service providers (ISPs).

One of the truly revolutionary characteristics of the Internet is its accessibility to millions of people worldwide. Market research estimates the number of Internet users to be between 9 and 30 million people worldwide (Hamilton, 1995; Rae-Dupree, 1996). According to the market research firm Dataquest, this figure is estimated to reach half a

billion by the year 2000 (Hamilton, 1995). The number of computers connected to the Internet (called *hosts*) has recently been counted at 9.4 million (Cady & McGregor, 1996), and is estimated to reach 120 million by the year 2000 (Bournellis, 1995).

Although over half of these hosts are in the United States, more than 22 new countries joined the Internet in 1995 (Bournellis). Other unique qualities of this innovation are the ability to access vast amounts of information and to do so with incredible speed.

Use of the Internet Within Public Health

Literature on the role of the Internet in the health professions is at present limited to descriptive accounts of available resources and how to access them, anecdotal accounts of the benefits and barriers in on-line communication, case studies of implementing Internet access within a group of professionals, and unpublished presentations at meetings and conferences. Although several of these accounts and presentations relate to the use of the Internet in public health, information on the use of this new technology in the field of health education remains sparse. Systematic research about the roles of the Internet in public health in general, and health education specifically, has not yet appeared to any extent in the literature.

In 1994, the Bauman Foundation undertook a project to expand the stakeholders in the National Information Infrastructure (NII, also referred to as the *information superhighway*, which is, for all intents and purposes, the Internet). One of the components of this project, "Community Needs in an Information Age," consisted of a pilot study of

organizations working in the environment, the economy, education, and public health.

This preliminary research found that these local and nonprofit groups are interested in on-line information that: “(a) alerts them to time-sensitive events related to their work; (b) describes model, successful strategies of other groups; © helps them better understand the populations they serve, and (d) informs them of funding opportunities” (Lynn & Koebrick, 1995, p. 1).

While the Bauman Foundation project provided a systematic look at a wide range of Internet-related issues, there are limitations in the application of these research findings to the questions posed by the current research. The research in the Bauman Foundation project was limited to the examination of federal on-line information use, and studied the use of the NII for federal information across a wide range of organizations.

In addition to this ground-breaking study of the Internet as a tool for making public information available to public health and other community organizations, the literature contains several accounts that describe the ways in which public health organizations are beginning to use the Internet. The American Public Health Association (APHA) debuted its home page on the WWW in October 1996, less than one year after the formation of the Electronic Communications Subcommittee of the Executive Board (“Internet a Promising Tool,” 1996). The WWW site offers membership information, action alerts on legislative threats to public health, over 40 on-line discussion groups, and links to other public health sites. Executive Board member James Leeper, the chair of the Electronic Communications Subcommittee, “sees electronic communications as useful

for reaching Congress, especially when time is short during critical health debates.

Members can now access an action alert and respond to an elected official within minutes” (p. 7).

The New Jersey Public Health Association (NJPHA) has also developed a WWW site, and is offering the first on-line Public Health Expert-in-Residence Program (“NJ Affiliate,” 1996). Dr. Sindy Paul from the New Jersey Department of Public Health was available on-line for several weeks in October of 1996 to answer questions about AIDS and emerging pathogens. This new program was developed to fill the need for networking among public health professionals who do not have the time to attend meetings and conferences. New experts will be featured periodically. The association is also working on many other electronic projects to link public health professionals with timely and critical information.

Public health professionals are also finding that the Internet can be a powerful tool in advocacy work. A recent article in *The Nation's Health* describes how the Internet is being used to disseminate critical workplace safety information via a WWW page, reach thousands of public health advocates in a very short period of time via e-mail, and provide instant access to tens of thousands of abstracts on minority health topics (“Harnessing information superhighway,” 1996).

In March 1994, the Division of Gynecologic Oncology at the University of Pennsylvania Cancer Center developed a cancer information WWW server called *Oncolink* available at no cost to all Internet users (Benjamin, Goldwein, Rubin, &

McKenna, 1996). OncoLink was developed as a way to ensure that Internet users would have access to quality information and resources in an organized and consistent manner. It includes patient information, physician-oriented review articles, and public information from the federal government and other institutions. In the first 18 months of operation, OncoLink received over 4 million requests for information from more than 100,000 different Internet addresses worldwide. The authors believe that “there is tremendous public and professional demand for on-line cancer information via the Internet. We feel that the Internet is an outstanding vehicle for providing quality cancer information for gynecologic oncologists, other health care professionals, and the public” (Benjamin et al., 1996, p. 8).

In the Bauman Foundation report described above, Lynn and Koebrick (1995) provide descriptive accounts of how some community agencies are using on-line federal information:

The [Midwest AIDS] Coalition is also an active user of the National Library of Medicine’s bibliographic abstract service, which allows them to receive information three to six months before it will appear in a library. This is key in the fast moving field of AIDS research. Similarly, the Santa Cruz AIDS Project downloads. . . the Center for Disease Control’s Daily Summary, which provides them with AIDS transmission data and with most recent treatment modalities.

(p. 4)

In addition to descriptive accounts, anecdotal accounts and case studies in the literature provide insight into the benefits and barriers in using the Internet. Bergman (1994) relates how rural physicians in Montana, Washington, and Oregon are using the Internet to get specialist consultations on x-rays and access journals and literature far beyond the capabilities of an on-site library. Although these rural providers are hundreds of miles from large academic centers, the Internet acts as a bridge to expand their resources and their reach. Medical students are also using the Internet to communicate with faculty members and access information on clinical alerts and treatment protocols while completing rotations in rural areas (Bergman).

The author of a recent article in the *Journal of the American Medical Association* believes that the Internet offers strategic opportunities for communities trying to organize (Yom, 1996). Yom reports that minority medical students have been extremely active on the Internet: For example, the Asian Pacific Islander American Medical Students Association supports a network offering e-mail and bulletin boards to medical students, residents, and physicians. The Asian Pacific Islander American Health Forum's site offers updates on HIV programs, rates of tobacco use, and developments in welfare and health care reform, in addition to a WWW-linked subscriber-only listserv on substance abuse and mental health for the Asian Pacific Islander community. The author believes that these examples show how such on-line forums can foster new connections between health care providers, service agencies, and communities, but cautions that for minority

communities, improved communications technology will not necessarily mean improved health care or improved access to care.

An article by Rizzolo and DuBois (1995) describes a case study of implementing on-line information and resources to nurses. The American Journal of Nursing (AJN) Company was awarded a grant by the Department of Health and Human Services Division of Nursing to provide formal and informal continuing education to nurses in medically underserved communities using electronic communications. Several of the objectives of this project included: establishing a bulletin board service for peer information-sharing; making patient information available on-line; increasing access to continuing education through conferencing with authors and offering continuing education articles on-line; and increasing access to existing resources through providing searchable databases and Internet access. The objectives were met through providing resources such as a "hot topics" forum where nurses discussed timely issues with other nurses on-line, and a journal club that provided articles to download as well as a forum to talk with authors and participate in "live" discussions.

Conference presentations provide a third source of information on how the Internet is being used in public health. The 1995 Annual Meetings of APHA and the Society for Public Health Education (SOPHE) included several presentations and discussions about the uses of the Internet, and many of these presentations focused specifically in the field of health education. At these conferences, information was presented on how the Internet is being used to: advise and teach students (S. Prowse.

personal communication, October 29, 1995; A. Taub, personal communication, October 31, 1995,); access information from medical libraries and on-line journals such as the Center for Disease Control's Morbidity and Mortality Weekly Report (J. Morris, personal communication, October 29, 1995); create home pages (sites on the WWW) for the purpose of sharing information about the agencies they work with (D. Harris, personal communication, October 29, 1995); send e-mail to subscribing health educators through a listserv (M. Kittleson, personal communication, October 31, 1995); provide health education (S. Brown, personal communication, October 29, 1995); provide and receive continuing education (R. Anderson, personal communication, October 31, 1995); and communicate with outreach workers in developing countries (J. Mullaney, personal communication, October 31, 1995).

At the 1995 APHA Annual Meeting, Lennon and colleagues presented the results of research at the University of North Carolina Health Communications Research Laboratory on developing and testing strategies for delivering tailored health messages via the Internet (Lennon, Bernhardt, & Strecher, 1995). These researchers believe that the availability of low-cost health education materials on the Internet provides a compelling argument for public health professionals to begin using the Internet to provide access to health education. In another APHA presentation, Levine provided information about *Go Ask Alice*, Columbia University's anonymous health education question and answer service on the Internet (Levine, 1995). Each week, ten to 15 new questions are researched, answered, and posted on the Internet through this WWW site. At the time of

the presentation, Go Ask Alice had a weekly readership of over 13,000 from all over the world.

Despite these examples of how the Internet is being used, it remains an innovation that is still in the early stages of adoption (Howard, 1995; Lynn & Koebrick, 1995). In a statement by the National Information Infrastructure Interagency Task Force regarding health care, it was said that “the health care sector. . . has lagged far behind the other sectors of our economy in applying information and communication technologies” (“Health care report,” 1994, p. 3).

The Future Potential of the Internet in Public Health

*“The most promising opportunity for delivering health information involves the Internet,
. . . the fastest growing communications medium in history”*

(Council on Competitiveness, 1996, p. 35).

In addition to the literature which describes how the Internet is being used, a body of literature is also forming around the future potential of the Internet in response to both persistent and emerging needs in public health and health education. This second body of literature begins to address the potential risks and barriers involved in utilizing the Internet as a tool in public health.

In general, the public is becoming more demanding and more sophisticated about the information it wants, especially as new technologies offer more ways to get

information. In addition, individuals are being asked to take more responsibility for their own health and well-being and to make more informed choices. To meet these growing information needs, the market for on-line health related information is rapidly growing (Council on Competitiveness, 1996). In addition, a recent report to Congress says that technology allows Americans to become better educated about and more involved in their own health, and declares that “consumer health information is a young and emerging field” (“New Technology Big Potential,” 1996, p. 2).

Indeed, usage statistics are indicating that the most-used areas of the Internet and other on-line services are related to health. In a 1995 study of America Online, the Better Health and Medical Forum was receiving 250,000 “hits” per month in its first year on-line. Since then, this number is estimated at one million hits per month (Skolnick, 1996). A survey of the users of this forum found an increase in understanding about when to seek medical screening tests, and increased ability to cope with a health or medical problem, and an increased understanding of health information specific to their needs and interests (Skolnick).

On-line self-help communities provide an example of what can happen when health information on the Internet is used in an interactive way. These communities are changing the typical dynamics between people with a health concern, families of these people, and clinicians and researchers by breaking down traditional boundaries and facilitating dialogue (Calbretta, 1996). In this way, Internet technology is helping to empower the health information consumer.

The Internet is showing the potential of becoming an important tool in providing health education information to the general public. In a report entitled Highway to Health: Transforming U.S. Health Care in the Information Age, the Council on Competitiveness reports that an internal HMO survey anticipates that interactive technology could be used effectively to provide general information about health conditions and procedures, prevention guidelines, health education video games, informed consent information, personal health maintenance programs, health risk appraisals, and on-line support groups (1996).

In addition to its potential as a tool for providing health education, the Internet is also becoming recognized for its ability to foster communication and collaboration among health education professionals. A recent article in the *Journal of Health Education* outlines a scenario of potential benefits of Internet use to health educators. These benefits include quick and inexpensive communication with national and international colleagues through e-mail, downloadable software and publications, easily accessed literature from libraries around the world, access to requests for proposals and other funding opportunities, the ability to join discussion groups, and the ability to post and browse job announcements (Stivers, Bentley, & Meccouri, 1995).

As noted by Thomas (1992), the potential is just as great for organizing communities as it is for organizing ourselves:

Health educators working to involve community members in community organization, social change, or social policy interventions are also making

extensive use of computers: to network with each other, to communicate with decision and policy makers, and to download data useful to their cause. (p. 279)

The current literature on the Internet acknowledges that along with the many potentials of this new technology, many barriers stand in the way of its accessibility and usefulness to a wide range of the population. However, if the barriers were overcome, Internet technology could have the powerful potential to foster and facilitate communication and collaboration. It could expand the sphere of interaction and influence of health educators, and foster a sense of global community. In an editorial in the *British Medical Journal* (1994), LaPorte states that

new technology can vastly improve the accumulation and dissemination of information on public health. . . . Moreover, much of public health and prevention depends on the transfer of information, which telecommunication systems provide very cost effectively. . . . Given the technology that is readily available, we could inaugurate a global health information infrastructure to improve health worldwide. (p. 1651)

The potential cost of not addressing the risks and barriers of incorporating the Internet as a tool for public health is that, instead of providing increased communication and collaboration, it could serve to widen existing gaps and even create new gaps. If not addressed, several barriers may prevent the Internet from realizing its potential impact on health. Internet technology, while revolutionary in many aspects, remains beyond the means of many individuals and organizations. One of the adverse consequences of the

spread of Internet use may be a phenomenon called information redlining, “the threat that low-income, minority, and rural communities will be excluded from the deployment of information technology” if the cost barriers to Internet access are not addressed (Bauman Foundation, 1995, p. ix). Many members of minority communities can not afford a computer or an on-line service, and getting these is not a priority (Yom, 1996). Yom also points out that many immigrant communities do not speak English, the standard language of the Internet. In addition, over half of all Americans have literacy skills below the eighth grade reading level (Doak, Doak, & Root, 1996), and until the technology advances, the Internet is still a mainly written form of communication.

Yom also cautions that the threat of this technology to immigrant and minority communities goes beyond barriers to access. The Internet poses potential risks to these and other vulnerable segments of the population, such as children, in the potential for vulnerability to research without informed consent and unsubstantiated health information (1996). In addition, Yom warns that the increasing reliance of providers and HMOs on on-line sources of health information may intimidate people into retreating from the health care system, and may draw resources away from “low-tech”, but proven, communication media (1996).

The Profession of Health Education

While media experts are creative in the extreme in using technology, few understand the rudiments of learning about health or how to translate health concerns into media

applications. Those of our graduates who can combine health education and media expertise will find employment opportunities in a range of new media-centered organizations.

(Clark, 1996, p. 54)

Health Education as a Profession

Although still developing its status as a profession, health education has adopted many of the identified characteristics of a profession, such as a national organization, a form of credentialing, journals, and codes of ethics (Livingood, 1996). Over the past 25 years, the profession of health education has undertaken a series of efforts to further define itself as a profession, including defining the role of an entry level health educator, developing a competency-based curriculum based on this role, and contributing to the theoretical base of health education (Taub, 1996).

Livingood (1996) notes that the process of defining and enhancing health education's status as a profession "creates opportunities related to societal influence and social jurisdiction" (p. 425) and that by avoiding the mistakes and limitations of other professions, health education can position itself as unique and of value to society. In his list of challenges to the profession, he advises the profession to continue to build upon and develop these unique and valuable characteristics of health education, including its interdisciplinary nature, its diversity in methods and practitioners, and its population-based versus client-based orientation.

Health Education at the Crossroads

As the 21st century approaches, the U.S. health care system continues to be faced with persistent public health needs. Continued debates over health care reform challenge the traditional emphasis on treatment over education and prevention in the U.S. health care system. The shift towards managed care delivery systems has placed an increased focus on the value of health education to promote health and self-management of health problems and to encourage and enable prevention (Clark, 1996).

The recent innovations in information technology are also reshaping the delivery of health care services. At a recent conference on emerging information technologies, Dr. C. Everett Koop stated that the telecommunications bill just signed into law is likely to do more to change the U.S. health care system than has anything within the last generation, and that it is his belief that information transfer will be at the center of health care in the 21st century (Skolnick, 1996).

With these changes in the focus and delivery of health care, health education finds itself at a crossroads. In an address to the AAHE/SOPHE Joint Graduate Standards Committee, John Seffrin (1996), the CEO of the American Cancer Society, shares his vision for health education at the crossroads:

I firmly believe that, both in theory and practice, health education is absolutely essential to the success of the next revolution in public health in America. . . . Let me put forth three important premises for you to think about. First, managed care is a reality and will become the primary means by which health care will be

delivered in the United States early in the 21st century. Second, that health care and public health increasingly will be controlled at the state, local, and community level. . . . Third, health education as a profession can, and I believe should, be a major player in the new “world order” of American health care. . . . With these premises before us, I believe professional standards and, ultimately, professional accreditation are inexorably linked to our profession’s vitality and relevance in the new millennium. (p. 32-33)

In response to these forces, several key debates are occurring in health education, including strategic planning and goal setting, the development of graduate level preparation standards, and credentialing competencies and requirements. Increasingly, technology and the Internet are entering these discussions as new tools for health education.

The major health education professional organizations are in the midst of strategic planning to carry the profession into the new millennium (“Executive Board,” 1996; Johnson, 1995). APHA’s strategic plan includes objectives for increasing the use of new and non-traditional media, such as the WWW, to promote public health, and for strengthening communication among members and affiliates through existing and new technologies (“APHA Strategic Plan,” 1996). Other objectives, although not specifically mentioning the Internet, contain activities that lend themselves to on-line communications technology: developing APHA’s capacity to advance public health policy and rapidly identify and respond to public health issues, and developing systematic

and comprehensive advocacy programs (“APHA Strategic Plan”). SOPHE has drafted long range goals and objectives that include using the WWW and other technologies to improve communication channels in order to expand SOPHE’s sphere of influence and develop leadership (L. Stegmier, personal communication, August 9, 1996). Similar to APHA, SOPHE has drafted other objectives which, although not specifically mentioning the Internet, contain activities that lend themselves to on-line communications technology: increasing public awareness of the value of health education, improving service to areas where SOPHE chapters do not exist, and developing a rapid policy identification and response process (L. Stegmier, personal communication, August 9, 1996).

In addition, key public health and health education organizations are developing and revising core practices, competencies, and graduate standards to ensure a public health work force capable of providing essential services in the 21st century (“Defining Public Health Workforce,” 1996). SOPHE is collaborating with the Association for the Advancement of Health Education (AAHE), the National Commission for Health Education Credentialing, Inc. (NCHEC), and the Coalition of National Health Education Organizations to develop standards for graduate studies in health education (Goldman, 1995). SOPHE is also working with a group of organizations tapped by the Department of Health and Human Services (DHHS) and the Centers for Disease Control and Prevention (CDC) to “help develop a set of core practices and competencies required by

the public health workforce to provide essential services in the 21st century” (“Defining Public Health Workforce,” 1996, p. 8).

In February 1996, the National Congress for Institutions Preparing Graduate Health Educators convened to review and discuss proposed graduate-level standards for health education and make recommendations for the implementation and adoption of the standards. The AAHE/SOPHE Joint Graduate Standards Committee completed its report in mid-1996, and the report was published in *Health Education and Behavior* in April, 1997 (Capwell, 1997). The committee proposed several responsibilities and areas of competencies and sub-competencies to reflect the changing environment of health education, including an area of responsibility involving the application of appropriate research principles and methods, with a competency in conducting thorough reviews of literature and a sub-competency in employing electronic technology for purposes of reference retrieval (Capwell). In the area of responsibility, “implementing health education programs,” new sub-competencies were proposed in assessing and applying new technologies and in critically analyzing new technologies and media for acceptability to diverse groups (Capwell).

The National Commission for Health Education Credentialing (NCHEC) recently determined that there was a need to examine the future of the health education profession. This examination began in the Fall of 1994, and culminated in 1996 with a meeting co-sponsored with the Coalition of National Health Education Organizations (CNHEO). At this meeting, emerging goals for the profession in the 21st century were set forth. One of

these emerging goals for health education is that it “incorporates current technology and is contemporary and dynamic” (NCHEC & CNHEO, 1996, p. 4). Necessary actions delineated to address this goal include establishing a health education WWW page on the Internet, establishing a technology clearinghouse, and encouraging health education organizations to utilize emerging technology (NCHEC).

Conceptual Framework

“An understanding of diffusion theory is . . . necessary if we are to fully comprehend and use the new interactive communication media”

(Chamberlain, 1994, p. 272).

Diffusion of Innovations

Diffusion is defined as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (Rogers, 1962, p. 5). Diffusion theory explains the communication process that takes place when innovations are introduced to and adopted (or not adopted) by a population. There are four main elements of diffusion of innovations that can be used as a focus of study: the innovation itself, the channels of communication within the system, the time of diffusion or adoption, and the social system in which the innovation is diffusing (Rogers, 1983). Research on the characteristics of innovations is the most common research of diffusion of innovations. Research on communication channels looks at the roles of change agents

and opinion leaders in the diffusion of an innovation. Research on the time aspect of an innovation's diffusion often examines the decision process and the rate of adoption.

Finally, research on social systems investigates the effects of the social system's structure and norms on diffusion of an innovation (Rogers, 1995).

The roots of diffusion theory are in agricultural sociology, where it was used to explain how new agricultural technologies spread or failed to spread among farmers (Rogers, 1983). Diffusion research has now been conducted within many disciplines. In the field of public health, it has been most widely used to study the spread of family planning methods in developing countries (Rogers, 1995). Diffusion of innovations has also been used within the field of health education to examine the adoption and implementation of programs (Goldman, 1994; Monahan & Scheirer, 1988).

Diffusion research has also been used to investigate the adoption of computer technology. Studies in the 1980s used diffusion of innovations to compare the characteristics of adopters and non-adopters of personal computers (Dickerson & Gentry, 1983; Dutton, Rogers & Jun, 1987). In the 1990s, diffusion has been used to study the adoption pattern of computing networks using an Internet precursor, BITNET (Gurbaxani, 1990). This study of BITNET analyzed the growth of the network over time and the pattern and rate of adoption by members of a population.

Characteristics of Innovations

The characteristics of innovations have been the main focus of diffusion of innovations research (Rogers, 1995). These characteristics can help explain different rates of adoption or nonadoption.

In the third edition of *Diffusion of Innovations*, Rogers (1983) outlined the five characteristics of innovations that help explain the rate of adoption. *Relative advantage* refers to the degree to which an innovation is perceived as better than the idea or technology it supersedes. *Compatibility* is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of the potential adopters. *Complexity* is the degree to which an innovation is perceived as difficult to understand and use. *Trialability* refers to the degree to which an innovation may be experimented with on a limited basis. Finally, *observability* refers to the degree to which the results of adopting an innovation are visible to others.

Linkage Systems

In the classical approach to diffusion of innovations, the innovation is seen as originating from a resource system, which is comprised of the researchers, developers, and technical experts, and diffusing into a user system, which consists of the individuals and agencies who will ultimately adopt or fail to adopt the innovation. Communication is traced in a unidirectional flow from the resource system to the user system. This approach has been criticized as it does not allow for the study of the contributions that each system

may make in both influencing diffusion and adapting the innovation to the user group as it is adopted, therefore overcoming many of the possible barriers to adoption (Orlandi et al., 1990).

The framework has been expanded through inclusion of a more interactive component called the linkage system (Havelock, 1971). This crucial but informal system represents the cooperative exchanges and interactions required to collaboratively develop user-relevant innovation and diffusion strategies (Havelock). Linkage systems are comprised of the collaborative activities of representatives of the resource system (the system from which the innovation originated) and representatives of the user system (the intended adopters) that facilitate the adoption process (Kolbe & Iverson, 1981). The linkage system serves to foster the capacity of the user system to successfully adopt an innovation through planning for the innovation and providing information, training, technical support, and access to outside resources (Havelock).

Opinion leaders are more likely than other members of the innovation's intended population to be at the center of interpersonal communication networks within the population and are also more likely to be exposed to numerous forms of external communication, thus making them key elements in the linkage system (Rogers, 1983). These opinion leaders are often early adopters and thus have expert knowledge of both the technology and insider knowledge of the user system (Rogers, 1983).

The study of the potential role of a new technology within a changing field calls for a fluid, exploratory, multimethod approach.

Classifications of Research

There are three main classifications of research design that categorize research according to its purpose: explanatory, descriptive, and exploratory (DePoy & Gitlin, 1994). Explanatory research, also called experimental research, is used when there is a widely accepted theoretical framework from which to study the research question, and enough is known about the topic and the population to develop a research hypothesis and prediction. Explanatory research is designed to reveal causative relationships and predict outcomes (DePoy & Gitlin). This type of research involves collecting, measuring, and analyzing quantitative data only.

Descriptive research is used to gather information about the population and the correlation of variables within this population. It is used when enough is known about the research topic to limit the topic to an area of interest and conceptualize variables.

Descriptive research studies tend to rely primarily on quantitative data collection and analysis (DePoy & Gitlin, 1994).

Exploratory research is useful in examining previously unstudied phenomena, building theory, or discovering variables (DePoy & Gitlin, 1994). It is used when little is understood about the population or the area of inquiry. As noted by Morse and Field

(1995), "if an extensive library search reveals very little previous information about a research topic, the topic is probably not developed enough to use quantitative methods, and an exploratory, descriptive study using qualitative methods should be conducted" (p. 13). Exploratory research can build theory or discover new variables through naturalistic methods, such as observation or interviewing, which seek to reveal underlying truths based on the experiences or perceptions of the study population. It can also include deductive methods which apply accepted theories or principles to explain a specific phenomenon and examine certain variables. Both qualitative and non-experimental type quantitative methods are used in exploratory research, and are often combined within the same study (DePoy & Gitlin).

Qualitative research is used to make sense of phenomena, to describe and explain the social world, and to develop explanatory models and theories (Morse & Field, 1995). Qualitative methods are best used when the research question pertains to understanding or describing a particular phenomenon or event about which little is known. While qualitative research involves documenting and describing patterns and concepts, identifying relationships between concepts, and creating theoretical explanations to explain them, not all qualitative studies seek to develop theory as an end result (Morse & Field).

Quantitative research methods that are most often used in exploratory research include passive observation and surveys. Passive observation is used to examine phenomena as they occur naturally and examine the relationship between variables

(DePoy & Gitlin, 1994). Surveys are used to describe the characteristics of a population and predict relationships between the characteristics (DePoy & Gitlin). Surveys can include written questionnaires and personal interviews. One of the advantages of written surveys is the large number of respondents over a wide geographical area that can be reached at minimal cost. However, the typically low response rate for mailed questionnaires may threaten the external validity of the research. While interviews avoid the problem with non-response, they are time consuming and costly to conduct over a wide geographical area.

Both qualitative and quantitative methods can be combined in the same study. Multiple methods of data collection enrich the researcher's understanding of the research topic and add richness and completeness by supplying contextual data (Morse & Field, 1995; Jick, 1983). When mixed methods are used simultaneously to address the same research topic, the technique is known as triangulation (Morse & Field; Jick, 1979). In research designs using triangulated methods, qualitative methods may be used to provide descriptions while quantitative methods may be used to measure variables. For example, a questionnaire may include both standardized tests or scales in addition to open-ended questions (Morse & Field). Each data collection technique, for instance, a structured instrument or an in-depth interview, is selected because of its focus on a different aspect or dimension of the topic of study (Knafl & Breitmayer, 1991).

Data Collection in Qualitative Research

Data collection in qualitative research can include interviews, written questionnaires, and observation (Morse & Field, 1995). Interviews used to collect qualitative data can be unstructured or semistructured (Morse & Field, 1995).

Unstructured interviews are used when the researcher knows very little about the topic and is learning about the topic as the interview progresses and subsequent participants are interviewed. In this type of interview, the researcher does not have a series of prepared questions to ask because so little is known about the phenomenon that none can be prepared. The goal of the unstructured interview is to let the participants tell their stories.

By contrast, the semistructured interview follows a loosely structured interview guide that directs the questioning while providing the participant with the freedom to explain the situation in his or her own words (Morse & Field, 1995). This type of interview is used when the researcher knows most of the questions to ask but cannot predict the answers.

Written questionnaires can be used to collect both qualitative and quantitative data. As a tool for collecting qualitative data, short-answer open-ended questionnaires are used (Morse & Field, 1995). This type of questionnaire is appropriate when some of the dimensions of the construct are known but all possible responses cannot be anticipated. Questionnaires are also appropriate choices for data collection when an interview might cause embarrassment or would be too costly or time consuming given the resources of the researcher and the geographic location of the participants.

Observation is a useful data collection tool for qualitative research in that it provides answers to contextual questions that cannot be answered by interview alone (Morse & Field, 1995). However, it is a time-consuming and costly method of data collection, and requires extensive note-taking and interpretation of subtle information such as facial expressions and body language.

Sampling in Qualitative Research

Sampling in qualitative research is guided by two principles: appropriateness and adequacy (Morse & Field, 1995). Appropriateness entails identification and use of the participants who can best inform the research according to the design of the study. Adequacy in sampling applies to collecting enough data to develop a full, rich description. Adequacy is usually assumed to have been reached at the point of saturation of the data, when further research uncovers no new data (Morse & Field).

Data collection in qualitative research is meant to be effective and efficient, not random and generalizable as in quantitative experimental research (Morse & Field, 1995). For this reason, participants may be obtained through different types of nonprobability sampling: convenience sampling, in which any available individual becomes a participant; purposive sampling, in which individuals are deliberately selected; snowball sampling, in which informants provide names of others who meet the study criteria; and quota sampling, in which attempts are made to include individuals likely to be underrepresented (DePoy & Gitlin, 1994). Convenience sampling is often used in

research settings such as clinics or physician offices, where volunteers can be recruited as they enter the research setting. Purposive sampling selects individuals to represent the larger group, and is useful when key informants or other leaders have particular knowledge of or a unique view on the research topic. Snowball sampling is often used when researchers do not have access to a population or cannot identify participants who may meet the study criteria. Quota sampling is used when the parameters of the population are known and the researcher wants to select participants who represent specific segments of the population (DePoy & Gitlin).

Summary

The topic of this research, the Internet, is a new technology with the potential to foster communication and collaboration among professionals and communities if potential barriers are overcome and risks are avoided. The population of interest in this research, the profession of health education, is in the midst of strategic planning to carry the profession into the 21st century. The current and dynamic nature of this research called for a fluid, exploratory multimethod approach that utilized the research data as it was gathered in framing and refining each subsequent method.

CHAPTER 3

METHODOLOGY

The purpose of this formative research was to investigate the potential of the Internet as a tool for communication and strategic collaboration among health education professionals through an exploratory examination of the perceptions and opinions of leaders and innovators in the field. The goal of this investigation was to explore the potential roles of the Internet in health education policy, research, and practice.

Research Questions

This research was designed to address the following research questions:

1. How are health educators currently using the Internet?
2. What are the perceptions of health education opinion leaders and early Internet adopters regarding the potential short- and long-term roles of the Internet in health education policy, research, and practice?

Research Objectives

This research was designed to meet the following objectives:

1. To describe how the Internet is currently being used within the field of health education.
2. To explore the potential roles of the Internet in the field of health education and the perceived benefits, risks, and barriers to using this new technology.

3. To analyze the data within the context of formal dialogue and planning currently taking place among health educators regarding the strategic directions of the profession.
4. To generate data which can be used by health education organizations, including professional organizations and academic preparation programs, to develop recommendations for using the Internet to meet strategic planning goals.
5. To contribute to the literature on diffusion of innovations, the Internet, and the future directions of health education.
6. To stimulate awareness and discussion of the potential of the Internet in the future directions of the field of health education.

Research Design and Procedures

This exploratory study surveyed health education professionals who were opinion leaders in health education, early adopters of Internet technologies, or both. The methodology was based on three triangulated, sequential components incorporating principles of qualitative research.

Triangulation in qualitative research is defined as a “multistrategy approach” (DePoy & Gitlin, 1994, p.150). The purpose of triangulated research methods is to “combine different methods to reveal an additional piece of the puzzle or to uncover varied dimensions of one phenomenon” (DePoy & Gitlin, p. 150). This study incorporated this multistrategy approach by collecting data from written surveys and personal interviews, as well as using both scaled and open-ended questions. In addition, a

focus group and an on-line chat group were planned. Each of the methods in this research used semistructured surveys and interviews. A semistructured approach to data collection is the most appropriate when the researcher knows most of the questions to ask, but cannot predict the answers (Morse & Field, 1995).

This study was composed of three triangulated, sequential components (see Figure 1) . In the first phase, health educators were surveyed as to how they were using the Internet in their work. The second phase consisted of in-depth interviews with health educators who had been identified in Phase I as opinion leaders as to their opinions about the future potential role of the Internet in the field of health education, given the Phase I findings. The third phase of this research was to consist of a focus group, an on-line chat group session, or both, comprised of purposively selected opinion leaders. The purpose of this final phase was to validate the research findings and interpretations.

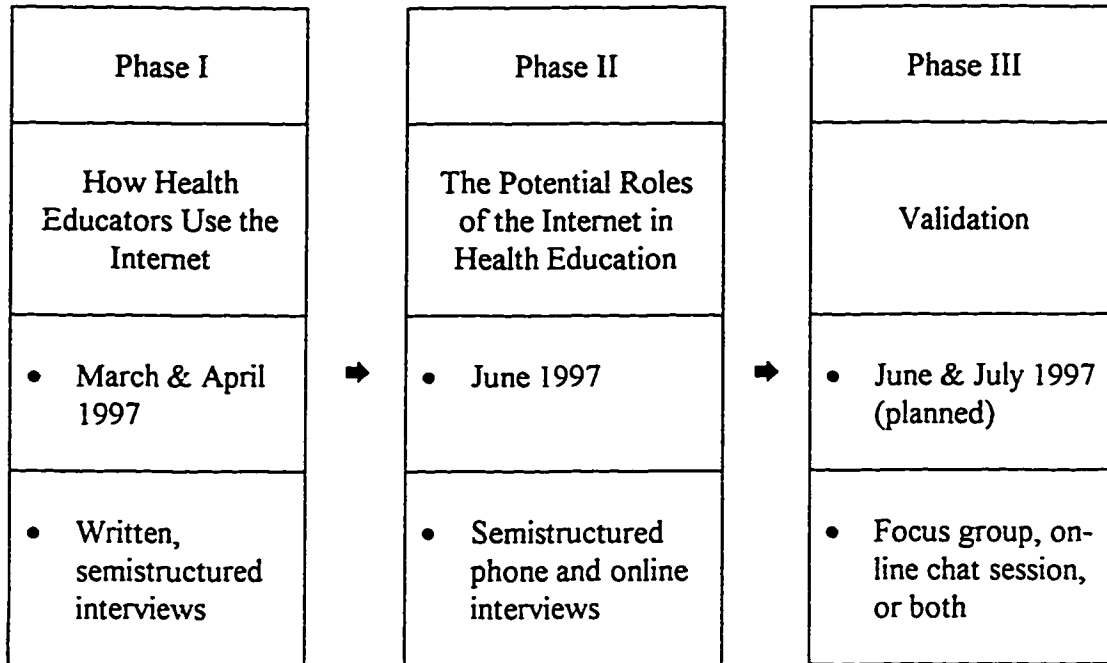


Figure 1. The three phases of this study.

Assumptions

The specific design of this study was based on assumptions about the topic itself, the sample population, and the methods employed. The assumptions in each area included:

Topic

1. Health educators are using the Internet.
2. The Internet is a promising technology for health education.
3. There is a link between the Internet and the strategic directions of health education.

Population

1. Health educators who have adopted the use of Internet technology would be able to put aside any pro-innovation bias and identify and discuss potential barriers and negative consequences of this technology.
2. Opinion leaders in the field of health education, who may or may not be adopters of Internet technology, would be able to identify and discuss the potential roles of the Internet in the field.

Methods

1. The researcher would be unbiased in her interaction with the subjects, and would not show a pro-innovation bias.

2. The research design would generate an adequate number of respondents to be included in the final sample and reach the point of saturation.

Phase I: How Health Educators Use the Internet

The first phase of this study was a cross-sectional survey of health education professionals who were innovators or early adopters of the Internet (see Figure 2). The purpose of Phase I was threefold: to identify and describe how health educators were using the Internet; to identify opinion leaders for the second phase of this research; and to gather demographic data needed for the purposive sampling in the second and third phases. The method used in this phase was a written semistructured survey containing both open-ended and scaled questions.

Sample Selection

The Phase I survey sample was created by means of snowball sampling. A core of 17 subjectively identified innovators and early adopters within this field was created through attending Internet-related sessions at the 1995 Society for Public Health Education (SOPHE) and American Public Health Association (APHA) Annual Meetings in San Diego, California, and the 1996 SOPHE Midyear Scientific Meeting in West Chester, Pennsylvania, as well as through the researcher's existing contacts.

Beginning with this core sample, potential participants were recruited into the study through either a phone call or an e-mail message using a pre-determined

Timeline:	<ul style="list-style-type: none"> • March and April 1997
Methods:	<ul style="list-style-type: none"> • Mailed survey • Cross-sectional sample created through snowball sampling
Population:	<ul style="list-style-type: none"> • Health educators who are using the Internet • Sampling goal = 75 to 125 completed surveys
Areas of Inquiry:	<ul style="list-style-type: none"> • Which Internet applications health educators are using • How health educators are using the Internet • Training and other resources utilized by health educators • Adoption category • Scaled items measuring seven attributes of innovations • Identification of other potential participants for Phase I • Identification of opinion leaders for Phases II and III
Intended outcome:	<ol style="list-style-type: none"> 1. Address research question number 1 2. Address research objective number 1 3. Identify opinion leaders for inclusion in the purposive sampling for Phase II
Analysis:	<ul style="list-style-type: none"> • Quantitative data were entered into Epi Info and analyzed for measures of central tendency, and variability. • Qualitative data were entered into Microsoft Word and analyzed for content, insight, and emergent themes. • Identified opinion leaders were coded for area of opinion leadership and demographic variables.

Figure 2. Summary of Phase I: How health educators use the Internet.

script (see Appendix A). This script introduced the researcher, summarized the research project, and outlined what would be asked of participants. Potential participants interested in completing the survey were asked to respond with a phone call or an e-mail and provide their mailing address. Surveys were sent to all those who agreed to participate. As part of the survey, participants were asked to identify other health educators they knew of who were using the Internet. These subsequent potential participants were then contacted using the same procedure as outlined above, and those who agreed to participate were sent surveys. This procedure was designed to be repeated until either the sampling goal of 75 to 125 completed surveys was reached, or until the point of saturation. A log was kept by the researcher with the names of potential participants, the dates they were contacted, their participation status, and the dates the surveys were sent.

Informed Consent

Approval from the San Jose State University Human Subjects-Institutional Review Board (IRB) was obtained in December 1996, before recruiting subjects and collecting data (see Appendix B). Surveys were mailed to participants with a cover letter explaining the purpose of the study, an estimate of the time required to complete it, and the procedures that would be taken by the researcher to protect their confidentiality (see Appendix C). Participants were asked to sign an enclosed informed consent form, previously signed by the researcher, and to keep this form for their records (see Appendix

D). They were also asked to initial a statement of informed consent on the first page of the survey, to assure the researcher that informed consent had been given.

The data collected in Phase I were confidential, but not anonymous. In order to protect the confidentiality of the participants, names were not included on the survey. Because of the researcher's need to know the identity of the participants for possible inclusion in Phases II and III, the surveys were coded with a number in the upper left corner. The contact log described above also contained the code number assigned to each participant. This document was password-protected, and kept in the researcher's personal computer. Printed versions were kept in a locked file cabinet in the researcher's home office.

Participants were asked to include their names on the final page of the survey if they wanted to receive a list of information and resources as compensation. Because this page may have contained the participant's name, it was included with the survey packet, but was not stapled along with the rest of the survey, nor was it coded.

Participants were assured that completed surveys would be kept in a locked cabinet in the researcher's home office and that neither their names nor their agency names would be used in reporting the results of the research. Because the snowball sampling method requires participants to identify and recommend other potential participants, the researcher had anticipated that subjects may ask how or by whom they had been identified. In order to protect the confidentiality of all subjects, the researcher planned to respond to all such queries with the statement: "your name was given by a

health educator who is a participant in this research. Because of confidentiality requirements, I am unable to give you a specific name.”

Data Collection

Instrument development.

The survey instrument was created using pre-existing scaled questions adapted for the purpose of this research, along with categorical and open-ended questions developed by the researcher. The survey included 16 questions from a set of general scale items, applicable to any innovation, measuring eight characteristics of innovations (Moore & Benbasat, 1991); three open-ended and seven categorical questions pertaining to demographics; two categorical questions regarding adoption category; and 13 open-ended, eight categorical, and four scaled questions addressing participants' experiences with using the Internet. In preparation for the second phase of this study, participants were asked to provide names of other health educators who use the Internet, and names of people considered by the participant to be opinion leaders in the field of health education and with regard to the Internet.

The survey instrument was pilot tested with ten colleagues. It was also reviewed by Donna Bell Sanders, MPH, the Materials Development Specialist with Education Programs Associates in Campbell, California, who has ten years of experience developing clear and easy-to-read materials. The purpose of the pilot test and professional review was to determine if the instrument was clear and comprehensive. Revisions were

made to the instrument as per the results of the pilot test and professional review. A copy of the final version can be found in Appendix E.

Data collection procedures.

After participants were recruited using the protocol described above, the researcher mailed packets containing a consent form, survey with cover letter, and return envelope with postage. All participants were asked to respond within two weeks of receiving the survey, and were given the option of returning the survey via mail or facsimile. As an incentive, those returning a survey were given the opportunity to receive a list of health education resources on the Internet, compiled by the researcher.

Participants were also invited to add their names, e-mail addresses, areas of interest, and resources that they had found useful to this resource list. All participants were given the opportunity to receive the results of this study by checking a box on the survey and indicating whether they wanted the results sent by mail or e-mail. Participants were also asked if they would be able to access these documents should they be made available through the WWW.

Follow up was conducted with participants who had agreed to participate but had not responded within three weeks of the date the survey was sent. These participants were given a phone call or sent an e-mail to remind them of the survey and encourage them to respond.

Upon completion of Phase I, letters or e-mails were sent to participants thanking them for their time. Resource lists were also sent to all participants who wanted them.

Analysis

Quantitative survey responses were assigned codes prior to distribution of the survey. A code book was developed for data entry and analysis. As the surveys were returned, they were immediately analyzed for names of other potential participants in the snowball sample. Completed surveys were then reviewed for readability and coded against the key for all quantitative and blank responses. Only readable surveys with initialed informed consent statements were selected for analysis.

Quantitative data were entered and analyzed using Epi Info, a statistics program for personal computers. Descriptive statistics were calculated to determine characteristics of the sample, including (a) distribution among demographic variables, (b) distribution of adoption categories, (c) measures of central tendency of the scaled questions, and (d) the distribution of the Internet applications used.

Qualitative data were entered into Microsoft Word for Windows and analyzed for content, insight, and emergent themes. As the data were entered, they were categorized by theme and coded. The categories were developed and refined as the data were collected.

Opinion leaders identified by the survey respondents were coded for area of opinion leadership (health education, Internet, or both), arena of practice, age, gender, geographic location, years in practice, and adoption category. This information provided

categories for the purposive sampling in Phase II. A running tally was kept for opinion leaders identified by more than one respondent. The names of opinion leaders identified by the survey respondents was coded for area of opinion leadership (health education, Internet, or both), arena of practice, age, gender, geographic location, years in practice, and adoption category. A running tally was kept for opinion leaders identified by more than one respondent.

Phase II: The Potential Roles of the Internet in Health Education

The second phase of this study consisted of semistructured phone and on-line interviews with purposively selected opinion leaders (see Figure 3). The purpose of this phase was to explore the potential roles of the Internet in the field of health education.

Timeline:	<ul style="list-style-type: none"> • June 1997
Methods:	<ul style="list-style-type: none"> • Phone or personal semistructured interviews
Population:	<ul style="list-style-type: none"> • Purposive sample of opinion leaders • Pre-set criteria for sampling include age, gender, geographic location, years in practice, and arena of practice • Further criteria and eligibility protocols were determined based on analysis of Phase I data • Sampling goal = 20 to 30 interviews, or saturation
Areas of Inquiry:	<ul style="list-style-type: none"> • The potential roles of the Internet in Health Education • Potential positive contributions of the Internet • Possible risks and barriers • Recommendations for incorporating the Internet into the strategic planning for health education
Intended outcome:	<ol style="list-style-type: none"> 1. Address research question number 2 2. Address research objectives 2 and 3
Analysis:	<ul style="list-style-type: none"> • Qualitative data were entered into Microsoft Word and analyzed for content, insight, and emergent themes.

Figure 3. Summary of Phase II: The Potential Roles of the Internet in Health Education.

Sample Selection

The Phase II sample was purposively selected from the population of opinion leaders identified in Phase I, together with additional opinion leaders identified by the researcher. Opinion leaders were identified by the researcher by: (a) their early adoption of Internet technologies, as indicated by Rogers (1983) that early adopters tend to be opinion leaders; and (b) their presentations on Internet-related topics at conferences, as indicated by Rogers that opinion leaders tend to be more cosmopolite.

The purposive sampling was based on both pre-set criteria and protocols for eligibility that were determined based on comparisons that emerged during data analysis. Pre-set criteria included demographic measures such as age, gender, geographical location, years in practice, and arena of practice. Protocols that emerged during analysis of Phase I data included number of times the person was identified as an opinion leader. The emphasis in sampling was on those who were identified as opinion leaders both within the field of health education and with regard to the Internet, and those who were identified as opinion leaders by more than one survey respondent in Phase I.

The option was left open to include those who were identified as opinion leaders in the field of health education, but not with regard to the Internet. The decision whether or not to include this option was to be determined based on the outcome of the first few interviews. The final sampling goal was 20 to 30 completed interviews, based on the quality of the interviews, the purposive criteria, and the point of saturation.

Potential Phase II participants were recruited to the study through either a phone call or an e-mail message using a pre-determined script (see Appendix F). This script introduced the researcher, summarized the research project, and outlined what would be asked of the participants. Potential participants interested in an interview were asked to respond with a phone call or an e-mail and provide a convenient time for the interview.

Informed Consent

Approval from the San Jose State University Human Subjects-Institutional Review Board (IRB) was obtained in June 1997, before recruiting subjects and beginning the interviews (see Appendix G). Before the interviews, participants were read or e-mailed an informed consent form. Participants were then mailed a signed copy of this form to keep for their records (see Appendix H).

Data Collection

Instrument development.

In preparation for the Phase II interviews, common directions and key issues in the professional discussions around graduate standards, credentialing issues, and strategic planning were identified through a literature review. The literature reviewed included drafts of strategic planning goals, objectives, and activities for SOPHE, reports from the AAHE/SOPHE Joint Graduate Standards Committee, and conference proceedings for a 1995 conference on the health education profession in the twenty-first century. The

purpose of this literature review was to develop background information, sensitizing issues, and a framework for guiding the interviews.

An interview guide was developed, consisting of eight open ended questions regarding the participants' perceptions of the potential role of the Internet in health education, and the potential positive and negative outcomes of those roles. The interview guide also contained an open ended question to encourage the participant to frame these potentials within the context of the strategic directions of health education. Finally, the guide contained eight categorical and open ended demographic questions.

The interview guide was reviewed by two colleagues for clarity and comprehension. The guide was revised according to their suggestions. The final version of the interview guide can be found in Appendix I.

Data collection procedures.

Interviews were conducted either on-line or over the telephone, based on the preference of the participant. As participants were selected according to the pre-set and emerging criteria, they were contacted by phone or e-mail to describe the purpose of this phase of the study and to invite them to participate. Participants were advised that the interview was designed to take approximately one-half hour. Those who were available for phone interviews were asked to choose a time when disruptions could be avoided, and were then called or visited at the scheduled time. For those who were unavailable for

telephone interviews or who suggested an on-line interview, the surveys and consent forms were e-mailed.

For the phone interviews, an informed consent statement describing the purpose of the study and the steps for ensuring confidentiality was read to the participants. Participants were also asked for permission to tape record the interview. For the on-line interviews, the participant was asked to read and return this statement via e-mail. The researcher started the tape and began the interview after written or verbal consent was given.

The interviewer covered the topics in the interview guide, although the order varied. Follow up questions were asked when necessary to clarify an answer. At the end of the interview, if the participant had not addressed the topic of the potential of the Internet in relation to the strategic directions of health education, this was elicited. The researcher asked the participants' permission to contact them again should a new issue arise in the later stages of data collection.

No financial compensation was offered to the participants. Each participant was thanked at the end of the interview and again the following day by e-mail.

Analysis

After each interview, the researcher reviewed her notes and began to analyze the data for themes. Responses were initially coded into four main theme areas: potential uses of the Internet, potential barriers and risks of incorporating the Internet as a tool for health

education, potential benefits of this new technology, and strategic directions of the health education profession. Responses in each main theme area were then subdivided into categories for more detailed analysis and comparison. The data were continuously analyzed for purposive criteria and for development of each of these four main theme areas.

Phase III: Validation

The third phase in this research was designed to consist of a focus group, an on-line chat group session, or both, with purposively selected opinion leaders. The key steps are outlined in Figure 4. These opinion leaders were purposively selected as a key informant within a strategic planning discussion or an area of health education practice. The purpose of this final phase was to present the research findings and interpretations for validation (see Figure 4).

Timeline	<ul style="list-style-type: none"> • June and July 1997
Method:	<ul style="list-style-type: none"> • On-line chat group, or • Focus group at the combined SOPHE Midyear Scientific Meeting/ ASTDHPPHE Annual Meeting, or • Both
Population:	<ul style="list-style-type: none"> • Key informants within strategic planning activities or areas of health education practice • Identified in Phase II • Purposive sampling of one key person per activity or area of practice
Areas of Inquiry:	<ul style="list-style-type: none"> • Semistructured discussion of the research findings and interpretations
Intended outcome:	<ol style="list-style-type: none"> 1. Address research objectives 4 and 6 2. Validation of the research findings and interpretations

Figure 4. Summary of Phase III: Validation.

Sample Selection

A sample of opinion leaders who were identified in Phase I and were interviewed in Phase II, along with those identified by the researcher, was purposively selected based on criteria that emerged after analysis of the data had begun. These criteria included area of opinion leadership and involvement with one of the key debates. Phase III was designed to invite eligible participants to attend either a focus group to be held at the combined SOPHE Midyear Scientific meeting and Association of State and Territorial Directors of Health Promotion and Public Health Education (ASTDHPPHE) Annual Meeting in Atlanta, Georgia, or to participate in an on-line chat group session with other opinion leaders. The sampling goal was six to ten participants per group.

Data Collection

Instrument development.

A list of questions was developed to help guide the discussion in these two groups. Questions were kept purposefully vague to avoid forcing the participants into validation of the findings. This list of questions was reviewed by two colleagues for clarity, and revised based on their suggestions. The final version of this focus group and chat group guide can be found in Appendix K.

Data collection procedures.

The focus group was planned for the combined SOPHE midyear meeting/ASTDHPPHE conference in Atlanta, Georgia, in May, 1997. Participants were to be given statements of informed consent to read and sign (see Appendix J). The researcher presented the research findings to the group, and then elicited feedback using the list of questions as a guide for the discussion.

The focus group was to be tape recorded, with the participants' permission. A research assistant was to take notes to supplement this tape recording.

For the on-line chat session, eligible subjects were contacted via phone or e-mail and invited to participate. They were given the date, time, and information for accessing the on-line discussion. For those who agreed to participate, the researcher's presentation of findings, along with the statement of informed consent, was sent via e-mail one week prior to the scheduled session.

The chat group was scheduled to be conducted during the week of June 30, 1997. Potential participants were given the WWW address for accessing the chat location. The researcher posted a summary of her findings to the chat room. Participants were instructed to introduce themselves and to post comments to the researcher's summary of findings and to respond to their colleagues' comments, using the list of questions as a discussion guide.

Analysis

The plan for the analysis of the Phase III focus group was to transcribe the audio tape and to review the notes. The on-line chat session was to be printed. The data were to be coded for themes and analyzed for validation or non-validation of findings.

Plans to Enhance Reliability and Validity

The reliability and validity of data were enhanced through the use of appropriate sampling guidelines, triangulation, the inclusion of a validation phase, and definition of concepts used.

Improper identification and selection of participants can compromise the reliability and validity of qualitative research (Morse & Field, 1995). Reliability and validity can be enhanced by following the sampling guidelines of appropriateness and adequacy (Morse & Field). Appropriateness refers to selecting participants who can best contribute to the research according to the principles and parameters of the study and the knowledge of the participant. Adequacy in sampling is reached when enough data are gathered to create a “full, rich description of the phenomenon” (Morse & Field, p. 80), which usually occurs at the point of saturation, where further interviews no longer reveal new data.

In this study, participants were selected who met certain pre-set criteria for eligibility, including working as a health education professional, having adopted the use of the Internet, or being identified as an opinion leader. Following these criteria helps

ensure the appropriateness of the sample. Adequacy was planned in this study by continuing the sampling procedures until a point of saturation of the data was reached.

In triangulation, different techniques are linked to counteract the weakness of the methods used and to provide different aspects of one phenomenon (DePoy & Gitlin, 1994). The triangulation of methods in this study served to balance the strengths and weaknesses of written surveys, personal interviews, and attitude scales, as well as to provide information on different aspects of Internet use in the field of health education.

The plan to include a validation component to this research was designed to enhance the validity of the data by confirming that the researcher correctly interpreted the meaning of the participants' responses and that the emerging theory adequately describes the phenomenon of the Internet's emerging role in health education.

CHAPTER 4

RESULTS

Phase I: How Health Educators Use the Internet

Phase I participants were recruited using a snowball sample. The sample started with a core of 17 health educators identified by the researcher through attending Internet-related sessions at several public health conferences. This core of 17 referred another eight potential participants who met the study criteria. Due to the small number of potential participants referred by the core sample, a message was posted on the Health Education Directory (HEDIR), a listserv for health educators, on April 8, 1997, inviting additional participants to the study. Fifty-eight health educators replied to this posting and agreed to participate.

In total, 83 health educators who used the Internet were referred to the study, and 79 agreed to participate. Of the 79 surveys that were sent, 61 were returned, resulting in a response rate of 77.2%.

Demographics

The Phase I participants were predominantly female, young, well educated, and moderately experienced in the field of health education. Sixty-six percent were female, and 34% were male. As shown in Table 1, the Phase I participants were generally young, with 83% of respondents under 50 years of age.

Table 1

Age of Phase I Participants (N = 61)

Age group	%
18 - 29	18
30 - 39	39
40 - 49	26
50 - 59	15
60 - 69	2

As shown in Table 2, Phase I participants were also well educated. Ninety percent reported possessing a master's degree or higher.

Table 2

Level of Education of Phase I Participants (N = 61)

Education level	%
Bachelor's degree	10
Master's degree	46
Doctoral degree	44

Approximately one third of Phase I participants reported having 5 years or less of health education experience (Table 3). Another one third reported between 6 and 15 years of health education experience, and the final one third reported 16 years of experience or more.

Table 3

Health Education Experience of Phase I Participants (N = 61)

Years in health education	%
Less than 1 year	3
1 - 2 years	10
3 - 5 years	18
6 - 10 years	31
11 - 15 years	5
Over 16 years	33

Over one half of the Phase I participants practiced health education in a university setting (see Table 4). The second most common arena of practice was government (16%), which included state and local health departments. Eighteen percent reported working in more than one arena of practice, two thirds of whom listed their job title as *consultant*.

Table 4

Arena of Practice of Phase I Participants (N = 61)

Arena of practice	%
University	51
Government	16
Research	5
Clinical/Health Care	3
Community Not-For-Profit	3
Community For-Profit	3
Other	18

As shown in Table 5, self-reported job titles also indicated that many Phase I participants worked in a university setting. Indeed, 46% of all respondents indicated working as university faculty. Fifteen percent of participants indicated health education job titles, 11% reported job titles related to management, and 11% reported working as a consultant.

Table 5

Job Titles of Phase I Participants (N = 61)

Job title	No.	% ^a
University Faculty		46
Assistant Professor	11	
Professor	10	
Associate Professor	4	
Doctoral Coordinator	1	
Faculty	1	
Graduate Assistant	1	
Health Educator		15
Health Educator	3	
Childbirth Educator	1	
Health Education Media Specialist	1	
Health Education Specialist	1	
HIV AIDS Educator	1	
Patient Educator	1	
Senior Health Educator	1	
Management		11
Director of Public Education	2	
Associate Director of Prevention	1	
Director of Health Education	1	
Director of Health Promotion	1	
External Affairs Director	1	
Manager of Health Promotion	1	
Other		28
Consultant	7	
Health Information Specialist	1	
Health Planner	1	
Contract Development Coordinator	1	
Counselor	1	
Evaluation Associate	1	
Office Worker	1	
Research Assistant	1	
Student	1	
Technical Assistance Specialist	1	
Writer	1	

Note. All categories are self reported.

^aPercent represents total job titles by category.

On average, Phase I participants were affiliated with 2.6 professional organizations. The range of professional organization affiliations went from a low of zero affiliations to a high of eight. Table 6 shows the percentages of Phase I participants belonging to each of the professional organizations. The most common affiliation was with the American Public Health Association (APHA), with 54% of respondents reporting membership in this organization. Forty-four percent of respondents reported membership in the Society for Public Health Education (SOPHE). In addition to the organizations listed in Table 6, 25 different professional organizations were mentioned in the other category.

Phase I respondents represented twenty U.S. states, along with one Northern European country (Finland). Participants from the United States were equally distributed between the four U.S. Census Regions: the Midwest (16), the Northeast (15), the South (15), and the West (14).

Table 6

Professional Organization Affiliations of Phase I Participants

Professional organization	%
APHA (American Public Health Association)	54
SOPHE (Society for Public Health Education)	44
AAHE (American Association of Health Education)	43
Local SOPHE chapter	39
State or local Public Health Association	21
ASHA (American School Health Association)	13
ACHA (American College Health Association)	5
ASTDHPPHE (Association of State and Territorial Directors of Health Promotion and Public Health Education)	3
Other	43

Note. Respondents identified a total of 162 professional affiliations, with most having membership in more than one organization.

Adoption Category

As shown in Table 7, sixty-nine percent of respondents identified themselves as either innovators or early adopters of Internet technologies within the profession of health education. An additional 21% identified themselves as being in the early majority.

Table 7

Adoption Categories of Phase I Participants (N = 61)

Adoption category	%
Innovator	30
Early Adopter	39
Early Majority	21
Late Adopter	8
Resistor	0
No Response	2

Learning to Use the Internet

Thirty-one percent of Phase I respondents taught themselves to use the Internet. In describing how they taught themselves, respondents indicated that they learned through reading (26%), trial-and-error (23%), and experimentation or practice (23%). Two respondents also indicated teaching themselves using on-line help available through e-mail, newsgroups, and bulletin boards. Other ways that Phase I participants reported learning to use the Internet included: learning from a friend or family member (8%), learning from a colleague (3%), and taking a class (2%). Fifty-six percent of respondents learned to use the Internet through a combination of the above sources. Over one half who reported using a combination of methods used self-teaching as one of the methods.

Phase I participants reported having started to use the Internet as early as 1981.

The average year of initiating Internet use was 1992, and the median year was 1993.

Between 1981 and 1993, 54% of the respondents began to use the Internet. The remaining 46% initiated use between 1994 and 1996. As shown in Table 8, the most common

Internet application or service first used by participants was e-mail (52%). Twenty-one percent of respondents indicated that the application they first used was the WWW. The third most common application or service first used was gopher (10%).

Table 8

Internet Service or Application First Used by Phase I Participants (N = 61)

Internet service/application	No.	% ^a
E-Mail		52
E-mail	31	
Eudora	1	
World Wide Web (WWW)		21
Mosaic	2	
Netscape	7	
Search Engines	1	
WWW	2	
Yahoo	1	
Commercial On-line Service Provider		5
Commercial On-line Service	1	
CompuServe	1	
Prodigy	1	
Other		20
Bulletin Boards	1	
FTP	1	
Gopher	6	
HEDIR	1	
Kermit	1	
Medline	2	
No Response		2

Note. All categories are self reported.

^aPercent represents total job titles by category.

Phase I participants cited a variety of reasons for initiating Internet use, and many cited multiple reasons. Twenty percent of Phase I participants cited reasons of opportunity: their workplace or family went on-line and they took advantage of the opportunity to learn to use the Internet. Seventeen percent were motivated to go on-line because of the availability of fast, inexpensive communication via the Internet. Fifteen percent cited the need to keep up with technology as a reason for their decision to use the Internet. Another 15% cited the availability of information on the Internet as a deciding factor. Thirteen percent cited curiosity as a reason for deciding to use the Internet. Several respondents also noted characteristics of the Internet that factored into their decisions to go on-line: Thirteen percent cited the ease of using the Internet and 11% cited the quick availability of communication or information.

Health Educators' Use of the Internet

Participants indicated having access to the Internet both at work and at home (64%), only at work (15%), and only at home (10%). Eleven percent reported having access at other locations, including both at home and at school (3), mobile access (2), at a public library (1), and only at school (1).

Participants indicated how often they used various Internet applications on a 4-point scale. Table 9 lists these Internet applications in order of frequency of use, along with the average score each application received on this scale and the percentage of respondents who used the application frequently (all the time or often).

Table 9

Frequency of Use of On-line Services and Applications

Service or application	<u>M</u>	% who use frequently ^a
E-mail	2.8	97
World Wide Web (WWW)	2.6	90
Search engines, such as Yahoo	2.3	85
Mailing lists or list serves	2.3	82
On-line databases, such as Medline	1.5	51
File Transfer Protocol (FTP)	1.2	38
Telnet	1.2	36
Commercial on-line service	.8	28
Newsgroups	.8	17
Gopher	.8	15
Private internets or intranets	.7	24
Bulletin boards	.7	13
Chat or talk	.4	8

Note. Frequency was measured on a 4-point scale (0 = never, 3 = all the time).

^aFrequently is defined as using the service or application all the time or often.

Ninety-seven percent of respondents reported using the Internet as a means of communication. As a means of communication, 93% of participants used the Internet for everyday communication and 77% used the Internet to participate in on-line discussions. Examples of how participants used the Internet for communication are shown in Table 10. Fifteen participants gave examples of using the Internet to communicate between members of committees and professional organizations, including distributing minutes and scheduling meetings. Fourteen participants gave examples of using the Internet to communicate with students, including advising and distributing and collecting assignments.

Table 10

Examples of Using the Internet for Communication (N = 61)

Example	No.
Communicating with colleagues	16
Participating in listservs	15
Communicating with committee members	15
Communicating with students	14
Sending and receiving documents	9
Asking questions	6
Staying abreast of professional issues and events	6

Note. Participants gave more than one response to this question.

Participants rated the helpfulness of the Internet as a tool for communication on a 5-point scale (1 = not helpful, 5 = very helpful). The average response was 4.5. Among those who reported using the Internet as a tool for communication, the average helpfulness score was 4.6, while among those who did not report using the Internet for communication, the average score was 1.

Ninety-seven percent of respondents also reported using the Internet as a way of finding information. For the purpose of finding information, 93% of all respondents reported using the Internet to research information, and 93% also reported using the Internet to find resources. Examples of how participants used the Internet to find information are shown in Table 11. Fourteen respondents used the Internet to download statistical information. Eleven reported using the Internet to find information about jobs. Eight gave examples of using the Internet to locate programs or organizations for the purpose of assessing existing services, marketing their own organization, or seeking partners for collaborative efforts.

Table 11

Examples of Using the Internet to Find Information (N = 61)

Example	No.
Searching for general health-related information	16
Downloading statistical information	14
Searching for jobs	11
Finding information for classes or presentations	10
Literature searches	9
Researching organizations or programs	8
Finding background information for projects	8
Downloading documents	6
Obtaining information from government agencies	5
Researching specific topics	3
Reading the news	3
Finding resources for clients	2
Finding resources for students	2
Finding resources for other health professionals	1
Researching grants	1

Note. Participants gave more than one response to this question.

The average score for the helpfulness of the Internet for finding information was 4.5. Among participants who reported using the Internet to find information, the average helpfulness score was 4.5, while the average helpfulness score among those who did not report using the Internet for this purpose was 4.

Ninety percent of respondents reported using the Internet as a means of providing or sharing information. Seventy-five percent of respondents reported that they or their organization run a WWW site for this purpose, and 22% reported running a mail list, newsgroup, or chat group. Seventy-three percent of all respondents reported using the Internet to share information or resources with other health professionals, and 61% reported using the Internet to share health data, a database, or documents. Examples of how participants used the Internet to find information are shown in Table 12. Sixteen participants described using the Internet to share information by answering questions in chat rooms, newsgroups, and listservs. One participant used the Internet as a way of providing professional development.

Table 12

Examples of Using the Internet to Provide or Share Information (N = 61)

Example	No.
Answering questions in chat rooms, news groups, listservs	16
Posting or passing along information about jobs	7
Passing along information from the Internet to colleagues	6
Marketing organizations, programs, or services	5
Passing along information from the Internet to the public	2
Sharing research results	2
Providing class or program information to students	2
Passing along information from the Internet to clients	1
Providing information to the media	1
Providing professional development	1

Note. Not all participants responded to this question.

The average score for the helpfulness of the Internet as a way of providing or sharing information was 4.3. Among participants who reported using the Internet for providing or sharing information, the average helpfulness score was 4.5, while the average helpfulness score among those who did not report using the Internet for this purpose was 2.3.

Eighty-seven percent of respondents reported using the Internet as a tool for collaboration. For the purpose of collaboration, 66% of all respondents used the Internet to transfer data or files between collaborators on a project, and 46% used the Internet for advocacy efforts. Examples of how participants used the Internet to find information are shown in Table 13. Twenty-six participants gave examples of using the Internet to share data or files between collaborators on a project, many noting that this was a fast and inexpensive way to work, especially over distances. Fourteen participants described using the Internet to organize around a policy or advocacy issue.

Table 13

Examples of Using the Internet for Collaboration (N = 61)

Example	No.
Sharing files or data for collaborative projects	26
Collaborating around advocacy or policy issues	14
Brainstorming or discussing ideas	5
Coordinating projects	3
Contributing to newsletters	1
Inviting organizations to join coalitions	1
Forming a nonprofit organization	1
Participating in on-line conferences	1

Note. Not all participants responded to this question.

The average score for the helpfulness of the Internet as a tool for collaboration was 3.9. Among participants who reported using the Internet for collaboration, the average helpfulness score was 4.2, while the average helpfulness score among those who did not report using the Internet for collaboration was 1.2.

Ninety-two percent of respondents reported used the Internet for *other* purposes. These other purposes include: *surfing* (80% of all respondents), downloading software (64%), and learning more about the Internet (49%). Several respondents provided examples of using the Internet to keep in touch with friends, family, and former students

(8), find information on their hobbies (6), and schedule travel and check weather and other information at travel destinations (5). One respondent noted that the Internet was a good way of keeping up-to-date on agencies the respondent identified as “the opposition,” such as the tobacco industry or the religious right.

Adoption Characteristics of the Internet

The Phase I survey included a set of 16 scaled questions designed to assess eight characteristics of innovations that can predict adoption: compatibility, complexity, image, observability, relative advantage, trialability, visibility, and voluntariness. These questions used a scale of 1 to 7, where a value of 1 corresponded to disagree strongly and a value of 7 corresponded to agree strongly. Fifteen of these 16 questions were measured on a positive scale, where *agreeing* with the statement corresponded to a higher measure of the adoption characteristic; however, the question assessing visibility operated on a negative scale, where *disagreeing* with the statement indicated a higher measure of the adoption characteristic. The results of the adoption characteristics are shown in Table 14.

Table 14

Mean Scores of Adoption Characteristics
of the Internet

Adoption characteristic	M
Compatibility	6.2
Observability	5.7
Relative Advantage	5.6
Complexity	5.1
Trialability	4.4
Image	4.1
Visibility ^a	3.1
Voluntariness	3.5

Note. Adoption characteristics were measured on a 7-point scale (1 = disagree strongly, 7 = agree strongly).

^a Visibility measure is reversed.

Phase II: The Potential Roles of the Internet in Health Education

Opinion leaders to be surveyed in Phase II were identified by Phase I participants.

Six opinion leaders were named by more than three Phase I participants: three health education opinion leaders and three Internet opinion leaders. These six opinion leaders identified by Phase I participants, along with six Internet opinion leaders identified by the researcher, were invited to participate in Phase II. Two opinion leaders did not respond to the researcher's invitation to participate, and one opinion leader agreed to participate but did not respond to requests for an interview. Altogether, nine opinion leaders participated in Phase II. Two of these opinion leaders had also participated in Phase I.

Demographics

Of the nine opinion leaders who participated in Phase II, one was identified as an opinion leader in the field of health education, and eight were identified as opinion leaders with regard to the Internet. Phase II opinion leaders were generally young and male. Of these nine opinion leaders, three were female and six were male. Four were in their 50's, two were in their 40's, two were in their 30's, and one did not respond to this question. By U.S. census region, three Phase II opinion leaders reported living in the West, two lived in the South, two lived in the Northeast, and one lived in the Midwest. The remaining opinion leader lived in Canada.

Phase II opinion leaders were also well-educated and experienced in health education. Five reported having doctorate degrees, three had master's degrees, and one

did not answer this question. Five also reported having 16 or more years of experience in health education, three had 11 to 15 years of experience, and one had 6 to 10 years of experience. Four worked in a University setting, two worked in a government setting, two worked in research, and one reported working as a consultant in the clinical, community not-for-profit, government, managed care, and school health arenas.

The Current Role of the Internet in Health Education

The opinion leaders provided their views on how the Internet is currently used in health education. They addressed the use of the Internet as a tool within the field of health education, as a way of collaborating among different professions, and as a means of providing health education.

The Internet as a Tool for Communication and Collaboration Within Health Education

Of the nine opinion leaders, seven agreed that the Internet is indeed being used as a tool for communication and collaboration within the profession of health educators. One opinion leader agreed that it is being used, but not to its full potential, and another did not answer this question.

The opinion leaders gave several examples of how the Internet is being used as a tool for communication and collaboration among health educators. Two opinion leaders each noted that the Internet is being used to keep current on issues in the field, discuss new ideas, and access a wide variety of information. Other examples included:

conducting research, participating in research, collaborating on papers, staying in touch with friends and colleagues, and delivering continuing education. The opinion leaders noted that the Internet is being used for this purpose through several applications and services, including e-mail, chat, listservs, and the WWW.

One Internet opinion leader mentioned that the HEDIR listserv and WWW site is “perhaps the model of how a WWW site and listserv can be coordinated to facilitate communication and collaboration.” This opinion leader explained that the HEDIR’s listserv allows “near real-time idea generation and problem solving,” while the HEDIR’s WWW site allows access to archived data.

The Internet as a Tool for Communication and Collaboration Among Professions

Three of the nine opinion leaders agreed that the Internet is being used to communicate and collaborate with professionals in other disciplines. The opinion leader in health education noted that “the interdisciplinary work on health education has increased enormously in recent years, just as the Internet became available. How much of this is cause and effect cannot be determined, but I find it much easier to communicate and collaborate with almost anyone working on health education.”

Two opinion leaders stated that while the Internet is being used for this purpose, it is not being used to its potential. One of these opinion leaders noted wanting to see more “cross-pollination” among different professions.

One opinion leader asserted that the Internet is *not* being used to communicate and collaborate with professionals in other fields. This participant noted that while this new technology can break down some of the boundaries that separate professionals in different disciplines, the traditional barriers remain: conflicting ideas of who is qualified to be a health educator and the health educator's domain, and the competition between the various professional organizations. This participant does not see any shift in communication and collaboration between members of different professions or disciplines "beyond hypertext links between pages of differ[ent] health agencies." The final opinion leader did not answer this question.

The Internet as a Tool for Providing Health Education

Two of the nine opinion leaders participating in Phase II agreed that the Internet is being used as a tool for providing health education. However, five believed the Internet to be limited in its ability to be a tool for providing health education. One participant did not address this question.

The health education opinion leader noted that while many people are using the Internet to find health information, "I'm not sure that any one provider or health educator has used it extensively and effectively as an alternative to other means of providing health education." Another opinion leader acknowledged that the Internet is being used to provide health education, but noted that it is only being used effectively for secondary and tertiary prevention activities, such as disease management. This opinion leader noted

that, despite the availability of on-line prevention brochures and health risk appraisal programs, there was “little documented use of the Internet for primary prevention.”

The Potential Role of the Internet in Health Education

Eight of the nine opinion leaders who participated in Phase II saw the Internet playing an increasingly important role in health education over the next 10 years. Two opinion leaders saw the Internet becoming the principal means of communication over the next 10 years. Two opinion leaders also saw an increase in the commercialization of the information available on the Internet as a trend for the future.

Participants identified future trends of the Internet as a tool for health educators and as a means of providing health education. As a tool for health educators, the opinion leaders' visions of the future of the Internet included: faster communications between and among health educators and other experts; on-line training programs beyond the currently available electronic correspondence courses; increased training opportunities using technologies such as gaming, simulation, and learner-oriented programs; and the availability of on-line libraries, not just catalogs, for research.

Four opinion leaders also identified future trends of the Internet in providing health education. One participant described the Internet as a future means of providing virtual support for health education and health promotion programs. Another saw the health education equivalent of telemedicine becoming available on the Internet. This health education-telemedicine application would provide “on-line, on-demand access to

information and experts.” Another opinion leader saw a future of new teaching and learning strategies through the Internet, with video conferencing and other video capabilities becoming commonplace. Yet another saw health educators interacting with clients on-line in the next 10 years.

In contrast, one opinion leader cautioned that while the Internet has been compared to the revolutionary communication media of television and radio, “technology is nothing more than a delivery truck. . . . I believe the next 10 years will establish a body of literature that separates the hype from the reality. When is the Internet a good delivery truck and when is it not?” This opinion leader further notes that “over 20 years of research in the field of new technology has established that technology does not fundamentally change the outcomes of educational interventions.”

Eight of the nine opinion leaders identified several contributions they believed the Internet would make to the field of health education. These contributions include: expanding the audience for health education, being able to receive health education without having to be at a specific place at a specific time, equalizing the roles of the client and the health educator, and increasing community participation and discussion. One opinion leader saw the Internet reshaping the role of the health educator from a provider of information to a “reliable provider of information *on* information.” Another thought that the interactive learning style used by Internet technologies would increase the excitement of learning.

Another opinion leader noted that, while the Internet may contribute “slicker” health education materials, and might possibly deliver health education to more people, the real contribution of the Internet to the field of health education would be the “increased community” between professionals without the barriers of time and place, and the distributed learning, collaboration, and professional development opportunities that this increased community would foster. Another opinion leader echoed this theme, describing the Internet as contributing a unique opportunity for health educators to share information, regardless of their arena of practice.

The Advantages of the Potential Role of the Internet in Health Education

Five of the nine opinion leaders who participated in Phase II identified advantages to the potential future of the Internet in health education relating to how people learn about health. These opinion leaders saw the Internet providing learning opportunities that: are increasingly self-paced and self-directed, are more precisely tailored to the learner, take advantage of “crucial educational principles such as the teachable moment,” actively involve the learner, and provide “just-in-time” learning for health educators and clients.

Four of the nine opinion leaders who participated in Phase II identified a change in the role of the consumer to be one of the advantages in their vision for the Internet in health education. This change in the role of the consumer included: a more equal relationship between consumers and providers of health care and health information,

increased power of the consumer, improved ability for self-care, and increased control through increased involvement in the consumer's own health.

The opinion leaders also identified several potential advantages to health educators. One opinion leader believed that the increased access to current scientific information that is becoming available through the Internet will increase the effectiveness of health education programs. Another thought that the Internet would provide health educators greater access to individuals and groups. Yet another opinion leader believed that the Internet would provide better exchange of ideas without geographic boundaries. Two opinion leaders thought that the Internet would "increase the agility of the profession," one noting that the Internet would help the profession innovate faster, and the other noting that "the days of the 12-month publication cycle are over."

The Risks of the Internet's Potential Role in Health Education

Opinion leaders also identified several disadvantages and risks to their visions of the future role of the Internet in health education. While two of the nine opinion leaders did not believe that there would be any risks if this technology were used appropriately, all of the opinion leaders identified potential disadvantages.

Four of the nine opinion leaders saw disadvantages to the Internet relating to the quality of available information. These opinion leaders noted the difficulty for the consumer in sorting the reliable, credible information available on the Internet from the misinformation, as one of the qualities of the Internet is that there are no restrictions on

who can publish information. One opinion leader mentioned not only the potential for misinformation, but the potential for fraud. Another opinion leader noted the risks in requiring consumers to be able to separate the good on-line information from the bad, as this will require new and sophisticated information-evaluation skills in clients. Yet another identified the potential for decreased credibility of all on-line information providers because of this potential for the proliferation of misinformation.

The health education opinion leader and one of the eight Internet opinion leaders identified risks to potential clients in their visions of the potential future of the Internet. These two opinion leaders noted that disadvantaged populations are less likely to have access to the Internet, and that the Internet could increase the gaps between the health-rich and the health-poor. The health education opinion leader added that “to turn to [the Internet] as a mainstay of health education would be to turn our backs on many populations who need health education the most.”

Four opinion leaders identified another disadvantage of an increased role of the Internet in health education as the loss of personal contact with clients, students, and colleagues. One participant noted that personal contact with a client provides useful information about how the client is receiving the information, and can break down communication barriers. Another explained that “health education has always considered itself a people profession. . . . In our rush to use the Internet we may lose this contact. . . . I see this with distance education courses--theoretically, any course could be taught via long-distance, but *should* it?”

One opinion leader saw the Internet providing increased potential for *non-*collaboration as programs and professional organizations race to develop WWW sites. This participant noted that the two main health education WWW sites, HEDIR and HEPR, “are trying to reach the same audience with the same kind of information support but are working at cross-odds with each other. Add to that SOPHE, AAHE, and APHA sites and you have the same fragmented non-collaborative nonsense that dominates non-Internet based interagency collaboration.”

Finally, another opinion leader identified the risk of alienating good professionals in the field with an overemphasis on technology. This opinion leader explained that “we may leave behind those people who are still very good health educators, but because of fear of technology, or lack of funds or resources, we have left [them] out of the loop.”

Barriers to Internet Use for Health Educators

Five of the nine opinion leaders identified lack of training in computers as one of the barriers keeping health educators from using the Internet. Three identified lack of Internet access as a barrier, and two each identified lack of equipment and technophobia. One participant believed that the biggest barrier is the negative attitude toward new technology among health education’s leadership and the tendency of the profession to criticize new ideas. Other barriers identified by the opinion leaders included: the lack of perceived value of the Internet, the cost of equipment, media illiteracy, and the lack of proven models of using the Internet in health education.

Phase II opinion leaders had several suggestions for overcoming these barriers.

Three of the nine opinion leaders suggested providing opportunities for continuing education offering CHES (Certified Health Education Specialist) units. Four opinion leaders also suggested adding college-level computer courses to the entry level or graduate competencies for health education. One opinion leader suggested continuing to provide training at the annual meetings sponsored by the professional organizations, and another suggested that universities provide low-cost training courses. Other suggestions included: recognizing model programs; lobbying for the hardware as an essential tool in the health educator's kit; developing solid research on the uses of the Internet; getting employers to commit to providing the hardware, software, and training required to use the Internet; and getting funders to require Internet access and media literacy for funding.

Implications for the Strategic Directions of Health Education

SOPHE's Strategic Planning

When asked to identify ways in which the Internet may come into play with SOPHE's strategic planning efforts, one opinion leader identified the possibility of using the Internet to conduct a massive focus group or nominal group process on strategic planning. The remaining opinion leaders were only able to identify future trends of SOPHE's use of the Internet. These trends included: national and chapter SOPHE WWW sites, using e-mail to identify the needs of health education professionals, providing

courses for CHES credits on the Internet, and supporting the development of the Internet through making annual meetings accessible on-line.

Graduate Level Preparation Standards

Seven of the nine opinion leaders thought that at least one course on the Internet should be required for all health educators. One opinion leader noted that measurable competencies around using the Internet need to be developed. Another explained that graduates of health education programs should be required to demonstrate competencies in using, not developing, Internet technologies to improve health education outcomes.

Credentialing

Two of the nine opinion leaders thought that using the Internet should be included as a competency for CHES accreditation, and another opinion leader thought that demonstrating Internet competency should be required for accreditation in the future, but not at present. Four opinion leaders thought that CHES units would become increasingly available through the Internet. Another opinion leader thought that CHES testing itself would go on-line, using simulation tools to measure the different areas of competency.

Phase III: Validation

The focus group to be held at the Joint SOPHE Midyear Scientific Meeting and ASTDHPPE Annual Meeting in May 1997 was not feasible due to the fact that the

Phase I and Phase II data were not analyzed by the time of this meeting. The plan for the on-line chat session continued.

Four opinion leaders who participated in Phase II and two health educators identified by the researcher were invited and agreed to participate in an on-line chat session for the validation phase of this study, however none of these six posted any comments in the designated chat room during the period specified by the researcher. The limitations of this lack of validation will be discussed in chapter 5.

Summary

Phase I data were collected from 61 participants. Phase I participants were generally young, female, well educated, moderately experienced in health education, and self-identified innovators or early adopters of Internet technology. Phase I examined how health educators learned to use the Internet and how they currently use the Internet, and rated the adoption characteristics of the Internet.

Phase II data were collected from eight opinion leaders. Phase II opinion leaders were generally young, well educated, and experienced in health education. Phase II examined these opinion leaders' perceptions of the potential future uses of the Internet in health education, as well as the advantages and risks of this future vision.

The data from Phase I and Phase II, as well as the lack of data from Phase III, are discussed in chapter 5. Recommendations based on this data are presented in chapter 6.

CHAPTER 5

DISCUSSION

This chapter explores the key themes of this research. Key themes of Phase I and Phase II will be discussed separately, and will then be examined together within the context of the strategic directions of health education. The limitations that were encountered in conducting this research, including the lack of Phase III data, will also be discussed, along with the reliability and validity of the results.

Key Themes of Phase I

Demographics of Participants

Phase I participants were generally young and well-educated, in keeping with the overall demographics of Internet users (SRI International, 1995). The overwhelming majority (90%) of participants possessed a graduate degree, with equal numbers having master's and doctorate degrees.

Most Phase I participants worked in a university or government setting. No participants reported working in international health, managed care, school health, or worksite health. The large number of respondents from a university setting, over half of all respondents, may account for the high percentage of doctorate degrees in the Phase I sample.

Several factors may be associated with this over-representation of university faculty and under-representation of other arenas of practice. One possible explanation

would be that university faculty were more likely to be included in the sample because they were more likely to be found where the researcher looked, presenting at conferences and participating in the HEDIR listserv. However, the composition of the Phase I sample may also be an indication of who is using Internet technologies. Universities and government organizations may be more likely than community clinics, community not-for-profit organizations, and international health agencies to have the equipment, infrastructure, resource personnel, and money to be on-line. In addition, universities and government agencies were connected to the Internet before it became a public entity, and therefore their employees have had more time to learn and incorporate Internet technology into their work.

Professional Organization Affiliations

Phase I participants were affiliated with a large number of professional organizations. This finding suggests that the health education professional organizations have many members who may be able to serve as resources for training and technical assistance around using the Internet.

In addition to being well-affiliated, several respondents provided examples of using the Internet as a part of their work with these professional organizations. These examples, along with the findings that almost all Phase I participants used the Internet as a tool for communication and finding information, and over 90% used e-mail and the

WWW frequently, suggest that health education professionals may increasingly expect and demand on-line access to and communication with their professional organizations.

How Health Educators Use the Internet

The large number of self-reported innovators and early adopters in the Phase I sample (69%) suggest that the Internet is an innovation that is still in the early stages of adoption among health education professionals. However, these innovators and early adopters are using the Internet in various and interesting ways. This study's findings of how health educators are using the Internet closely parallel the literature on how the Internet is being used within the broader field of public health.

A pilot study by the Bauman Foundation found that community organizations are interested in on-line information that alerts them to current events, describes other programs, helps them better understand the populations they serve, and alerts them to funding opportunities (Lynn & Koebrick, 1995). Similarly, Phase I participants gave examples of using the Internet to get information about news, current health information, recent research and literature, upcoming conferences and trainings, legislative action alerts, and current policy and advocacy issues. Several participants also told of using the Internet to research programs similar to their own as part of an assessment of available services, in order to find potential collaborative partners, and to learn of other programs and strategies being used. While Phase I participants did not give any examples of using the Internet to conduct needs assessments or gather other information about client

populations, many did describe using the Internet to download statistical data specific to the population they served or the health issue on which they were working. One participant cited using the Internet to find information about grants.

An article in *The Nation's Health*, the monthly publication of the American Public Health Association, predicted that public health professionals would find the Internet useful for alerting them to time-sensitive information, especially around the areas of policy and advocacy ("Internet a Promising Tool," 1996). Indeed, Phase I participants did report using the Internet to keep abreast of current issues and to identify and respond to policy and advocacy issues. Interestingly, another participant noted that the Internet was a good way to keep track of "the opposition," in her case, the tobacco industry and the religious right.

Another article in *The Nation's Health* described the New Jersey Public Health Association's WWW site and the opportunity it provided for public health professionals to log on and participate in question-and-answer sessions with guest experts. The data from this study support that health education professionals are indeed using the Internet to ask questions of experts in the field. The data from this study also indicate that this is a reciprocal relationship; many respondents told of using the Internet to both ask and answer questions. Participants also described using the Internet not only for asking questions and sharing their expertise, but for brainstorming, sharing ideas for new programs or approaches, passing along information to colleagues, and engaging in dialogue and debate.

Many Phase I participants also gave examples of using the Internet to find the most recent information on different health topics. Several participants told of searching the Internet for current information just before giving a lecture or presentation on a particular topic. Others told of using the Internet to conduct a background search for information before starting a project or paper. In all of these examples of using the Internet, the speed at which information could be accessed, and the availability of the latest information were key themes.

The data from this study offer preliminary evidence that health education professionals are beginning to use the Internet to provide health education services to clients. One third of participants indicated using the Internet to provide information to clients or the general public, however, few of these gave specific examples. Ten participants described WWW sites run by themselves or their agencies offering consumer health information on a variety of topics, including women's health, drug and alcohol abuse, tobacco, parenting, and sex education. Another participant ran a WWW site serving as a clearinghouse for businesses looking for employee health information on the WWW. One participant also described running listservs and chat rooms for consumers on pregnancy and parenting issues. Three participants told of passing along the addresses of useful WWW sites to clients or the general public.

Only one participant described a WWW site that provided health education services beyond information; this site was run by the student health service at a university. This finding is not surprising, as the other data from this study suggest that

universities may be more likely to be on-line than other organizations. In addition, students may be more likely than other client populations to have access to the Internet, given that Internet users are generally young and well educated, and that students are often given free or low-cost access to the Internet through the university. One participant who worked for a large health care agency described the agency's plan to soon add health education pages to their current WWW site.

While this research did not reveal on-line health education networks as extensive as those described in other health professions (Benjamin, Goldwein, Rubin, & McKenna, 1996; Rizzolo & DuBois, 1995), the data do suggest that health educators are beginning to form on-line professional information and resource networks. The two main on-line health education professional resources are the Health Education Directory (HEDIR) and Health Education Professional Resources (HEPR). Both of these sites operate out of universities. HEDIR offers a directory of e-mail addresses of health educators, an international health education listserv, chat rooms, syllabi of health education courses from several colleges and universities, and links to other sites that provide health-related information. HEPR offers links to state and local public health departments, a calendar of upcoming conferences and trainings, and a listserv for members of a professional organization. HEDIR and HEPR are both accessible via the WWW. Other examples of health educators forming on-line networks include a WWW site linking participants in a national tobacco control project involving 17 states, a private WWW site for one state's

local health departments and hospitals, and WWW access linking another state's rural community health promotion specialists to the health department and each other.

Technical Assistance Resources

The data from this research offer a glimpse at the linkage system, the informal system of cooperative exchanges and interactions required to collaboratively develop user-relevant innovation and diffusion strategies (Havelock, 1971), that is developing around the diffusion of the Internet among health education professionals. Colleagues, family and friends with technical knowledge, and Management Information Systems (MIS) personnel were all cited by respondents as people they turn to for technical assistance with the Internet. Due to their large number of professional affiliations, the participants of this study may also serve as a part of the linkage system by helping other members of the professional organizations adopt the use of the Internet.

Key Themes of Phase II

Demographics

While Phase I participants named a total of 32 Internet opinion leaders, only three of these opinion leaders were identified by more than one participant; 24 were named by only one participant. Similarly, while 64 people were named as health education opinion leaders, only three of these were identified by more than one participant; 46 were named by only one participant. One Internet opinion leader was identified by 22 of the 61 Phase

I participants (36%), and another was identified by 11 Phase I participants (18%). One health education opinion leader was named by 16 Phase I participants (26%). All three of these opinion leaders participated in Phase II. Only two of the Phase II participants had also participated in Phase I.

Similar to Phase I participants, Phase II participants were generally young and well-educated, in keeping with the overall demographics of Internet users (SRI International, 1995). Eight of the nine Phase II participants possessed a graduate degree, with more of the opinion leaders having doctorate degrees than master's degrees.

Like Phase I participants, Phase II participants also worked primarily in university or government settings. No Phase II opinion leaders reported working in a clinical setting, community setting, international health, managed care, school health, or worksite health, although one opinion leader reported working as a consultant in several of these various settings.

This over-representation of opinion leaders in university and government settings and under-representation of opinion leaders in other arenas of practice, and the similarity of Phase I and Phase II participants may be due to several factors. One of these may be the fact that the Phase II opinion leaders were identified by the Phase I participants, and health educators may tend to know other health educators who practice in the same arena. Alternatively, more health educators who practice in university and government settings may be using the Internet than health educators in other arenas.

The Current Role of the Internet in Health Education

The Phase II data on how health educators use the Internet echoed the Phase I data: Phase II opinion leaders agreed that the Internet already plays an important role in communication among health educators, and is being used to a more limited extent in providing health education. Data from the opinion leaders also provided an added dimension to the Phase I participants' descriptions of how the Internet is coming into use.

One opinion leader noted that health education has already established some models of using listservs and the WWW to facilitate communication and collaboration among health educators. These model sites are the HEDIR and HEPR. However, another opinion leader brought up the issue that these two Internet resources for health educators were working at cross-purposes with each other. This opinion leader notes that the existence of these two similar resources illustrates what can happen when health educators rush to make use of this new technology without collaborating.

Another opinion leader believed that the Internet would not prove to be a useful tool for communication and collaboration among professionals of different disciplines. This opinion leader explained that the traditional barriers keeping professions from working with each other remained, and while the Internet may break certain barriers to communication, these traditional barriers were more difficult to overcome. The traditional barriers were described as conflict over who should be qualified to provide health educator, conflict over the health educator's domain and area of expertise, and the

competitive nature and lack of collaboration of many of the health education professional organizations.

The Potential Role of the Internet in Health Education

The Phase II opinion leaders agree that over the next 10 years, the role of the Internet in health education will increase. While the literature suggests that the Internet may be useful for health education activities such as advocacy (“Harnessing Information Superhighway,” 1996) and finding information about populations and grants (Lynn & Koebrick, 1995), many of the opinion leaders saw the real potential of the Internet in its ability to foster communication and collaboration. This finding is supported by several accounts in the literature of WWW sites fostering communication among public health professionals (“Internet a Promising Tool,” 1996; “NJ Affiliate,” 1996).

The literature has also suggested that the Internet can and should be used as a way of providing health education (Council on Competitiveness, 1996; “Go Ask Alice,” 1995). Indeed, Phase II opinion leaders identified several potential future trends of the Internet as a provider of health education, including a health education version of telemedicine, and on-line communication with clients. However, the Phase II opinion leaders cautioned that the Internet’s role as a tool for delivering health education has limits. One opinion leader noted that the Internet has been used effectively to provide secondary and tertiary prevention activities, such as disease management, but has not been documented as a provider of primary prevention. Another cautioned against using

the Internet as a way of providing health education without determining whether or not it is an effective and appropriate delivery tool.

One interesting theme from the Phase II opinion leaders that was not found in the literature was the future of the Internet in health education creating a shift in the role of the health educator. One opinion leader described the new role of the health educator as the expert in providing “information *on* information.” Several opinion leaders mentioned the need for health educators to be able to help clients develop critical evaluation skills to sort the useful information from the misinformation available on the Internet.

The Advantages of this Potential Role

The literature suggests that the public is becoming more demanding and more sophisticated about the information it wants, and is accessing this information on-line in increasing numbers (Council on Competitiveness, 1996; Skolnick, 1996). The Phase II opinion leaders saw this increase in demand and availability of on-line information as playing a positive role in empowering health care consumers.

Phase II opinion leaders also saw an advantage of the potential role of the Internet in helping the profession of health education to be more agile. One opinion leader saw publication of research happening faster, and another believed that the Internet would help the profession innovate faster by generating ideas, providing an arena for discussing new ideas, and sharing information about model programs nation- and worldwide.

The Disadvantages and Risks of this Potential Role

The literature identified several barriers and risks to the accessibility and usefulness of the Internet, including the cost of equipment (Yom, 1996), and the threat of information redlining (Bauman Foundation, 1995). The Phase II opinion leaders also identified one of the main risks of incorporating the Internet into health education to be the fact that the Internet reaches those populations who are at lowest risk. One opinion leader believes that by using this technology, health educators may be leaving behind those who need health education the most.

The other main theme that came out of the opinion leaders' identification of disadvantages and risks was the questionable quality of information that is available on the Internet. While Internet technology may allow people to become better educated about and more involved with their health ("New Technology Big Potential," 1996), the opinion leaders also warn that it allows for the proliferation of misinformation and fraud, and may lead to consumer confusion and loss of credibility of all on-line health information providers.

Implications for the Future Direction of Health Education

As discussed in chapter 2, health education is a profession at a crossroads. In response to persistent public health needs, recent innovations in information technology, and the changes in the focus and delivery of health care, several key debates are occurring in health education. These debates include strategic planning and goal setting, the

development of graduate level preparation standards, and credentialing competencies and requirements. Increasingly, technology and the Internet have entered these discussions as new tools for health education.

Strategic Planning

Data from the first two phases of this study suggest that health education is indeed moving towards strategic planning objectives and goals set forth by several professional organizations to work towards using new technology. The American Public Health Association's strategic plan includes objectives for increasing the use of new and non-traditional media, such as the WWW, to promote public health, and for strengthening communication among members and affiliates through existing and new technologies ("APHA Strategic Plan," 1996). SOPHE has drafted long range goals and objectives that include using the WWW and other technologies to improve communication channels in order to expand SOPHE's sphere of influence and develop leadership (L. Stegmier, personal communication, August 9, 1996).

The data from Phase I of this study indicate that health educators are using the Internet to communicate and collaborate with their colleagues, to share programmatic information with each other, to ask questions of each other, to offer expertise, to provide information and health education to clients and to the general public, to research current topics, and to share research results. Phase II opinion leaders suggest that the professional organizations support the development of the Internet's role in health education by

beginning to utilize the Internet and by embracing new ideas. These data imply that the specific advantages of the Internet, such as its ability to provide fast and inexpensive communication and collaboration among professionals, could be incorporated into the goals and the methods used in SOPHE's strategic planning.

Graduate Level Preparation Standards

Phase II opinion leaders saw the Internet as an important tool for health educators. They believed that health educators should be required to take courses or be able to demonstrate competency in using the Internet. One opinion leader suggested that these requirements be implemented gradually. Another emphasized that health educators should be able to demonstrate that they can appropriately use this technology, and should not necessarily be required to develop the technology. The data from Phase I and Phase II of this study suggest that the Internet is an important tool for professional collaboration, and has the potential to develop into an important tool for other health education activities. In addition, these data indicate that one of the main barriers that health educators face in using this technology is the lack of training. These data imply that Internet technology should be incorporated into the profession's planning for graduate level preparation standards.

One of the main disadvantages of the Internet identified by Phase II opinion leaders is the amount of misinformation available on the Internet and the skills that will be needed by consumers to sort the reliable information from the unreliable information. This disadvantage suggests a new role for health educators. As one of the opinion leaders mentioned, health educators may become experts in providing information *on* information. However, if a health education job title becomes seen as a way of marketing reliable health information, and therefore becomes seen as advantageous and profitable, this raises new issues regarding the credentialing debate (L. Stegmier, personal communication, May 6, 1997). Just as anyone can currently publish information on the Internet, anyone can decide to be called a health educator. If health educators are to establish a new role for themselves providing appropriate, reliable information via the Internet, standards delineating who is a qualified health educator may be necessary.

Limitations

There were several limitations to this study. They are described as methodological limitations and sample limitations.

Methodological

The Internet is a rapidly evolving technology. It is reshaped by each user who adopts it and uses it to search for or provide information. In addition, the boundaries of

the Internet are changing. As this study was entering the conceptual stages, commercial on-line providers, long kept separate from the Internet, began to offer their subscribers access to the Internet. As the first phase of this research was being conducted, technology was released allowing people to access the WWW through their television sets, without needing a computer. Due to the evolving nature of the topic, the researcher defined the Internet loosely for the purposes of this research. *The Internet* was used to refer to a wide range of on-line services and applications, from true Internet applications such as FTP and the WWW to on-line services that can be accessed without using the Internet, such as e-mail and commercial on-line services.

The methodology used in Phase I of this research was called into question by several participants. Several participants commented that it seemed ironic, and even inappropriate, that an assessment of how health educators are using the Internet be conducted via a mailed survey. They suggested that on-line methods would be more appropriate to study on-line behaviors.

While the researcher acknowledges the seeming irony in using what is referred to by the Internet community as *snail mail* to study the Internet, one of the main advantages of which is the speed and inexpensiveness of communication as opposed to traditional methods, the researcher stands by her choice of methods for several reasons. First, it was expected that there would be a wide range of experience with the Internet among the Phase I participants. Second, since the Internet is a developing technology, many of the ways of sending and receiving information over the Internet require that both the sender

and the receiver have particular software. These two reasons would make sending and collecting surveys via e-mail cumbersome, and may exclude participants who did not know how to use the technology or did not have the right software.

The third reason for sending and collecting the surveys through the mail, rather than through the Internet, was the expertise of the researcher. The researcher is a recent adopter of Internet technologies herself, and has learned to use the Internet as she has conducted this research. While it may have been beneficial for the researcher to learn how to send and collect surveys via the Internet, the time it would have taken to learn this technology well enough to be comfortable using it as a method of data collection would have further delayed this research. Additionally, many of those who commented on the methods were from university settings; this research found that health educators at university settings often had computing departments available for technical assistance. This researcher, however, did not have this resource available to her.

The other main methodological limitation in this study was the lack of a validation phase. This phase was designed to enhance the validity of this research by presenting the data and the researcher's conclusions back to members of the population for verification that the researcher did not misinterpret the findings. The lack of this validation phase leads to the possibility that the researcher may have indeed misinterpreted the meaning of the data that were gathered and thus may have drawn false conclusions based on the data.

The main limitation in developing the Phase I sample population was the difficulty in locating health educators who used the Internet, but who had not joined the HEDIR listserv. The core of the snowball sample, identified through Internet-related presentations at conferences, did not refer as many potential subjects to the study as anticipated. Because of this difficulty in obtaining a sample through snowball sampling, a message was posted to the HEDIR listserv, an international listserv of health educators, consisting of the HS-IRB-approved script for recruiting subjects. Fifty-eight health educators responded to this posting and agreed to participate in this research. The snowball sample again faltered when the participants recruited through the HEDIR posting primarily referred other HEDIR participants, or referred the researcher back to the list. The researcher did not follow up on these contacts, as the members of the HEDIR listserv had already been solicited through the original posting, and had either replied or declined to reply.

The researcher introduced bias into the sample by contacting only the health educators referred to the study whose e-mail addresses were provided by the referring participant. This decision was made due to time constraints, however the researcher acknowledges that this may have introduced bias into the sample, as health educators with e-mail addresses may differ significantly from health educators without e-mail addresses.

Finally, the researcher ended sampling after two rounds, due to time constraints and the large number of referrals back to the HEDIR list participants. Ending the snowball sample prematurely may have biased the sample with an over representation of HEDIR listerv members and did not allow the researcher to find the point of saturation.

Another limitation of this sample was the fact that it was not randomly chosen. This nonrandom sample limits the generalizability of the research findings. Because the sample included such a large number of innovators and early adopters, the sample may have also served to reinforce the pro-innovation bias that is common to diffusion research.

Validity and Reliability

Sampling in qualitative research is guided by the principles of appropriateness and adequacy (Morse & Field, 1995). Appropriateness refers to the identification and use of participants who can best inform the research as it is designed. Adequacy in sampling applies to collecting enough data to develop a full, rich description.

The final Phase I and Phase II samples were appropriate in that they were health educators who used the Internet, and were able to provide rich data. However, a limitation in the appropriateness of these samples is the overrepresentation of health educators at university and government settings. In addition, the lack of time for the full snowball sample to develop may have affected the adequacy of the data. These limitations may affect the validity and reliability of this research.

CHAPTER 6

RECOMMENDATIONS

The purpose of this formative research was to investigate the potential of the Internet as a tool for health education professionals. This research was conducted through a semistructured survey of health educators in Phase I and in-depth interviews with opinion leaders in Phase II. Based on the findings of this study, the researcher provides recommendations for future research and for health education policy, research and practice. Recommendations are also made for stimulating awareness and discussion of the potential of the Internet in health education.

Recommendations for Future Research

Recommendations for future research are:

1. Include health educators in community, clinical, school, and worksite settings in future research on the Internet in health education. Future research should also attempt to include health educators with bachelor's degrees in the sample population. Because of the over representation of health educators working in university and government settings in Phases I and II of this research, it is unknown whether the results of this research are representative of how health educators as a whole use the Internet and see its potential in the future of this profession.
2. Conduct a validation or evaluation phase. One of the major threats to the validity and reliability of this study was the lack of a validation phase to ensure that the researcher

correctly interpreted the data. Future researchers are encouraged to experiment with innovative ways of using new technology for this crucial step of qualitative research, but are cautioned to prepare for unexpected circumstances that may arise in using a new technology as a research method. For instance future researchers incorporating a chat group in their research methods may want to consider conducting phone reminders the day before the scheduled chat session, planning a longer open chat time, or having alternate plans for validation should the chat session not work as planned.

3. Consider using on-line data collection methods. The researcher found the use of e-mail to send messages to potential participants describing the research and inviting them to participate to be very effective. Using e-mail to contact potential participants was less expensive and time-consuming than long-distance phone calls would have been, and allowed those contacted to read the message and respond at a time convenient to them. In addition, future researchers should consider the advantages of collecting data on-line, such as the speed and lower cost of distributing an on-line survey. However, future researchers are cautioned to fully examine the technology needed to not only distribute an instrument, but to collect the completed instruments. There is a wide range of technology to send on-line information, and sending and receiving complex documents often requires specific software that many people may not have. For this reason, quantitative data may be easier to collect on-line than qualitative data. Future researchers are cautioned to test any on-line technology before deciding to use it, and to choose the most appropriate

method of data collection based on the study population and the type of data to be collected.

Recommendations for Health Education Policy, Research, and Practice

Recommendations for health education policy are:

4. Expand the use of the Internet as a tool for providing information and organizing around policy issues affecting health education. The existing literature and this research both suggest that health educators are using the Internet as a way of learning about policy and advocacy issues and responding to government and businesses regarding these issues in a timely and convenient way.

Recommendations for health education research are:

5. Researchers should consider using the Internet to share information about current research and model programs with health educators in the field. Health education is faced with the same problem as many other professions: those who conduct research in the “ivory towers” of universities often do not communicate with professionals who are working in the field. Thus, a gap exists between the current research and the implementation of the research findings into health education programs. As the Internet has been identified in the literature and the current study as a potential tool for increasing collaboration among professionals of different arenas and disciplines, researchers in universities should be encouraged to use the Internet to communicate with health

educators in the field. Similarly, health educators involved in model programs should use the Internet as a strategy for sharing their experience with these programs with other health educators.

Recommendations for health education practice are:

6. Health educators should use caution in using the Internet as a tool for providing health education. As one of the Phase II opinion leaders cautioned, just because the Internet is new technology does not make it a better method of delivery. Before using the Internet to provide health education, health educators should consider whether or not it is the most effective and appropriate method given the population they are reaching and the information or services they plan to deliver.

Recommendations for Stimulating Awareness and Discussion of the Potential of the
Internet in Health Education

Recommendations for stimulating awareness and discussion about the Internet are:

7. Health education professional organizations should take advantage of members who are innovators and early adopters of the Internet. The participants in this study were well-connected with a variety of professional organizations. Several participants gave examples of using the Internet to facilitate committee work within professional organizations. In addition, several opinion leaders saw professional organizations such as

SOPHE having WWW sites on the Internet in the future. Professional organizations should recognize the talent and leadership of these innovators and should utilize their skills and knowledge.

8. Professional organizations, as well as health educators in university and government settings, should foster the capacity of other health educators to use the Internet. Lack of training was the main barrier identified by Phase II opinion leaders keeping health educators from using the Internet. The number of participants in this study from university and government settings suggest that health educators at these settings may be able to provide training and technical assistance to other health educators. Professional organizations may be able to serve as coordinators and may be able to arrange continuing education units for these trainings.

9. Health education should establish a role for itself in the diffusion of the Internet as a tool for providing health information. One of the greatest risks inherent in the Internet, as identified by the opinion leaders in this study, is the proliferation of misinformation and even fraud because of the fact that anyone can publish health information on the Internet. This study suggested that important new roles for health educators will include becoming experts on finding reliable information on the Internet, helping clients learn to evaluate the reliability of health information on the Internet, and becoming providers of accurate, appropriate, and accessible on-line information. Further, health education should demand a role in any discussions that arise regarding evaluation or control of health information on the Internet.

10. Health education professional organizations should provide a forum for discussing the implications of incorporating Internet technology into the profession. The results of this study, along with the existing literature, suggest that while there are many advantages and benefits to using the Internet, there are many disadvantages and risks as well. These risks include the potential for leaving behind both health educators and populations without access to this technology, and rushing to use a new technology without considering whether it is the most appropriate method of reaching the intended population and the best allocation of scarce health education resources. These risks deserve serious consideration. Professional organizations should incorporate discussion of these benefits and risks into their planning and discussions for the strategic directions of the profession into the new millennium.

Summary

The first phase of this study investigated how health educators were using the Internet through a survey of innovators and early adopters of this technology. The second phase explored the potential future roles of the Internet in health education through in-depth interviews with opinion leaders. The data from this study indicate that health educators are indeed using the Internet, and are using it for communicating and collaborating with one another, as a tool for finding and sharing information, and even as a tool for providing health education. The data further suggest that the Internet's role in health education will be expanding in the future. However, data from both phases of this research indicate that there are barriers to using the Internet, such as lack of equipment,

lack of training, and fear of new technology, and risks inherent in this technology, such as the lack of personal contact with clients and colleagues and the potential for misinformation and fraud.

Based on this research, the Internet has the potential to play an important and useful role in the profession of health education. Incorporating the Internet into the current discussions about the strategic directions of health education may help health education incorporate the positive characteristics of this new technology while minimizing the risks. In addition, incorporating the Internet as an integral part of these strategic directions may help position the profession as a key player in the health field in the 21st century.

Appendixes

Appendix A: Phase I Recruitment Script

“Hello, my name is Wendy Boman. I am a student in the MPH program at San Jose State University. I’m conducting research for my Master’s thesis on how health educators are using the Internet and the future potential of the Internet in our profession. My advisor is Dr. Kathleen Roe.

“I’m calling/sending you this e-mail because we met at _____ (initial core of subjects)/your name was given to me by one of your colleagues (subsequent subjects), and I’d like to know if you are interested in participating in this study. I’m beginning the first of three phases, which assesses how health educators are using the Internet. If you’d like to participate, I’ll mail you a survey which will take about 15 to 20 minutes to complete, and a postage-paid envelope for you to return the survey. I’m asking for participants to complete the survey within two weeks.

“You are, of course, under no obligation to participate. While there is no monetary compensation, I’d be happy to share some resources with you as a way of thanking you for your time.

(For e-mail messages only) “If you’d like to participate, please reply to this e-mail and include your mailing address, or you may call me at (408) 363-0354.”

(For phone calls only, if the subject would like to participate) “To what address should I mail your packet?”

Appendix B: Phase I IRB Approval

Office of the Academic Vice President • Associate Academic Vice President • Graduate Studies and Research
One Washington Square • San Jose, California 95192-0025 • 408/924-2480

TO: Wendy Boman
5684 Herma Street
San Jose, CA 95123

FROM: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies & Research

DATE: December 13, 1996

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"The Current and Potential Future Roles of the
Internet in Health Education Policy, Research,
and Practice"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Serena Stanford, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

Appendix C: Phase I Cover Letter

College of Applied Sciences and Arts • Department of Health Science
One Washington Square • San José, California 95192-0052 • 408/924-2970

Dear health education colleague,

I need your help in conducting a study of the potential roles of the Internet in health education policy, research, and practice. I am conducting this research as a part of my Masters thesis. The purpose of this research is to gather opinions and perceptions of health educators who are using the Internet. The results of this study should help individual health educators and health education professional organizations understand the potential benefits, risks, and barriers to using this new technology as we prepare to enter the new millennium.

The first phase of this study is an assessment of how health educators are using the Internet. Attached is a questionnaire asking about your experiences using the Internet, and your attitudes about different aspects of this technology. Will you please spend 15 to 20 minutes to complete and return this survey?

As we discussed previously, your participation is voluntary. Choosing not to participate in this study, or in any part of this study, will not affect your relations with San Jose State University.

The results of this study may be published, but any information that could result in your identification, including your name and the agency you work for, will remain confidential.

Although you may not benefit from participating in the survey itself, you will have the opportunity to learn about resources that may be helpful to you. You will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary report of the results of this study. I do not anticipate that you will face any risks by participating in this study.

If you have any questions about this study, I will be happy to talk with you. I can be reached at (408) 363-0354, or via e-mail at wendyb3@ix.netcom.com. If you have questions or complaints about research subjects' rights, or in the event of a research related injury, please contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.

Thank you for your time.

Sincerely,

Wendy Boman
Graduate Student/Principal Investigator

Appendix D: Phase I Consent Form

College of Applied Sciences and Arts • Department of Health Science
One Washington Square • San José, California 95192-0052 • 408/924-2970

Agreement to Participate in Research

Responsible Investigator: Wendy Boman

Title of Protocol: The current and potential future roles of the Internet in health education policy, research, and practice—Phase I: How health educators use the Internet.

Please read this agreement carefully.

1. I have been asked to participate in a research study investigating the current and potential future roles of the Internet in health education policy, research, and practice.
2. I will be asked to complete a written survey which asks about the ways in which I use the Internet and my attitudes and opinions about it. The survey will be mailed to me in March or April 1997, and I will complete it at my convenience and mail or fax it back within two weeks of receipt.
3. I understand that there are no risks anticipated for participating in this study.
4. I understand that there are no direct benefits anticipated from participating in this study.
5. I understand that the results of this study may be published, but no information that could result in my identification will be released.
6. As compensation for my time, I will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary of the results of this study. These will be sent to me upon completion of this research.
7. If I have any questions about this study, I can contact the principal investigator, Wendy Boman, at (408) 363-0354. I can contact the Chair of the Health Sciences Department, Dr. William Washington, at (408) 924-2970 if I have any complaints about this study. If I have questions or complaints about this study, subjects' rights, or research-related injury, I can contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.
8. I understand that if I do not want to participate in this study, my decision will not jeopardize any services that I am otherwise entitled to.
9. Participation in this study is voluntary. I may refuse to participate in this study, or any part of this study. If I decide to participate, I am free to withdraw at any time, without affecting my relationship with San Jose State University.
10. I have received a signed and dated copy of this consent form.

Your signature means that you have agreed to participate in this research.

The signature of the principal investigator means that the investigator has agreed to include you in this study and has fully informed you of your rights.

Your signature

Date

Investigator's signature

Date

Appendix E: Phase I Survey

Health Educators on the Internet

Survey Instructions

If you would like to participate in this study, please:

1. Read the attached consent form.

If you agree to participate, please sign the form and keep it for your records.

2. Complete the survey.

It should take between 10 and 20 minutes.

3. Return the survey within two weeks:

- by mail, in the attached pre-paid envelope.
- by fax, to (408) 363-0354. Please call or e-mail me to let me know when you'll be faxing so I can set the computer to receive.

If you have any questions, or would like to add something after you've returned your survey, feel free to call or e-mail me. My business card is attached.

Thank you for your time.

I have read and signed the enclosed consent form, and I agree to participate in this study.

Please initial this box.

This part of the survey asks about how you're using the Internet.

1. How often do you use these Internet and other on-line services or applications?

All the time!	Often	Once in a while	Never	
				Bulletin Boards
				Chat or Talk
				Commercial on line service, like CompuServe, AOL, or Prodigy
				E-mail
				File Transfer Protocol (FTP)
				Gopher
				Mailing lists or list servers
				Newsgroups (Usenet News, Net News)
				On-line databases, such as Medline
				Private internets or intranets
				Search engines, such as Yahoo and Alta Vista
				Telnet
				The World Wide Web (WWW)
				Other (please describe): _____

2. Which Internet application did you use first?

3. When did you start using this application?

4. Where do you have on-line access?

	Home
	Work
	Both
	Other: _____

5. In your work as a health educator (paid, volunteer, professional development, or other), how are you using these Internet and other on-line applications?

	To communicate
	For every-day communication, as a replacement for phone, fax, or mail
	To participate in on-line discussions, through mail lists, chat groups, or other discussion groups
	Other: _____
	Other: _____
	Other: _____

5a. Please elaborate or give some examples about how you're using the Internet as a tool for communication:

5b. As a health educator, how helpful have you found the Internet to be as a tool for communication?

1 2 3 4 5

 Not helpful Somewhat helpful Very helpful!

	To collaborate
	For advocacy efforts
	To mobilize around a current issue
	To transfer files or other data between collaborators on a project
	To foster partnerships with other groups or agencies
	Other: _____
	Other: _____

5c. Please elaborate or give some examples about how you're using the Internet as a tool for collaboration:

5d. As a health educator, how helpful have you found the Internet to be as a tool for collaboration?

1 2 3 4 5

 Not helpful Somewhat helpful Very helpful!

- Question 5, continued from page 2 -

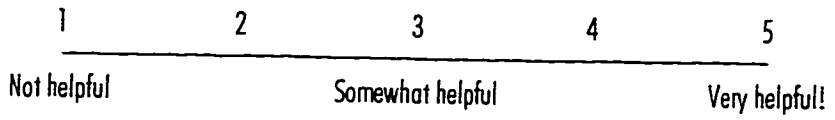
	To provide or share information
	To provide health education to clients
	To share or provide access to health data, a database, or documents
	To administer a newsgroup or mail list, or to moderate a chat group
	To run a web site
	To disseminate research results
	To post job openings
	To share information or resources with other health professionals
	To share information or resources with clients or the general population
	To market your agency or program
	Other: _____
	Other: _____
	Other: _____
	Other: _____

5e. Please elaborate or give some examples about how you're using the Internet to provide or share information:

5f. If you or your organization has a Web site or other Internet presence, please describe the content:

5f. If you or your agency is running a mail list, newsgroup, or chat group, please describe the topic and the participants:

5h. As a health educator, how helpful have you found the Internet to be as a way of providing or sharing information?



– Question 5, continued from page 3 –

	To find information
	To research information
	To find resources
	To download documents
	As a data collection tool for research
	To find job openings
	Other: _____
	Other: _____

5i. Please elaborate or give some examples about how you're using the Internet to find information:

5j. As a health educator, how helpful have you found the Internet to be as a way of finding information?

	1	2	3	4	5
	Not helpful			Somewhat helpful	
				Very helpful!	

	For other purposes
	To learn more about the Internet
	To 'surf', or see what's available
	To post a resume
	To download software
	As a distraction from work
	Other: _____
	Other: _____

5k. Please elaborate or give some examples about how you're using the Internet for these other purposes:

6. What led to your decision to use the Internet or go on-line?

7. How did you learn to use the Internet?

- I taught myself.
Please describe how: _____
- From a friend/family member.
Please describe this person's background (ie, "a medical librarian"): _____
- From a colleague.
Please describe this person's background: _____
- I took a class.
Please describe the class & where it was offered: _____
- I attended a training or conference.
Please describe the training and who it was offered by: _____
- Through an in-service at work.
Please describe the trainer's background: _____
- Other: _____

8. Who do you turn to for support, technical assistance, or advice on using the Internet?

9. What are your favorite on-line health education resources (Web pages, on-line data bases, newsgroups, etc.)?

10. Do you have any other stories or examples you'd like to share about how you've used the Internet in your role as a health educator?

This part of the survey asks about your attitudes on using the Internet.

- Please circle the number that tells how strongly you agree or disagree with each statement.
- For these questions, the "Internet" can include other commercial on-line services (like CompuServe) that allow you access to the Internet.

11. Although it might be helpful, using the Internet is certainly not a mandatory part of my job.

1	2	3	4	5	6	7
I disagree strongly	I have no feeling one way or the other				I agree strongly	

12. Using the Internet helps me accomplish tasks more quickly.

1	2	3	4	5	6	7
I disagree strongly	I have no feeling one way or the other				I agree strongly	

13. Using the Internet improves the quality of work I do.

1	2	3	4	5	6	7
I disagree strongly	I have no feeling one way or the other				I agree strongly	

14. Using the Internet enhances my effectiveness on the job.

1	2	3	4	5	6	7
I disagree strongly	I have no feeling one way or the other				I agree strongly	

15. Using the Internet gives me greater control over my work.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

16. I think that using the Internet fits well with my work as a health educator.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

17. I think that using the Internet fits well with my professional values and goals.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

18. My colleagues who use the Internet have more prestige than those who do not.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

19. My colleagues who use the Internet have a high profile.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

20. Overall, I believe that the Internet is easy to use.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

21. I believe that it is easy to find what I am looking for on the Internet.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

22. The results of using the Internet are apparent to me.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

23. I would have difficulty explaining why using the Internet may or may not be beneficial.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

24. Using the Internet is not very visible in my organization, or among my colleagues.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

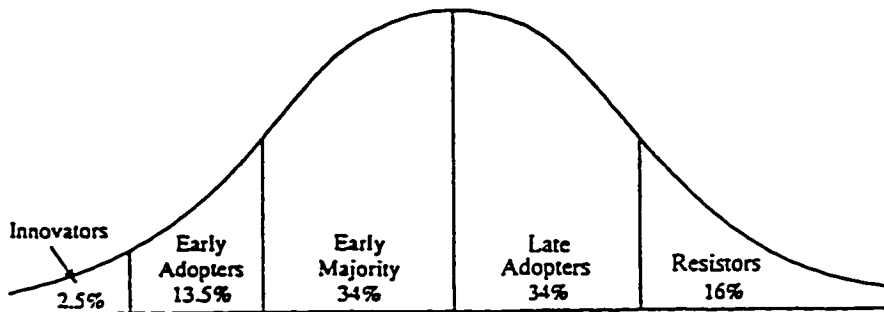
25. Before deciding whether to use any Internet application, I was able to try it out.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

26. I was able to use the Internet on a trial basis long enough to see what it could do.

1	2	3	4	5	6	7
I disagree strongly		I have no feeling one way or the other			I agree strongly	

This part of the survey asks about your attitudes towards using new technologies.



This figure shows the categories of people who start using a new technology. The idea is that a few people will start using the new technology before almost everyone else in their community. This small group of people are called “innovators.” The next group of people to adopt the technology are called “early adopters”, and so on.

27. You are a part of the “community” of health educators. Given what you know about how many of your colleagues are using the Internet, where would you say that you fall on this adoption curve in relation to others in your community?

- I’m an Innovator.
- I’m an Early Adopter.
- I’m in the Early Majority.
- I’m a Late Adopter.
- I’m a Resistor.

28. Which category best describes your approach to new computer or communications technologies?

- I’m venturesome. I’m very quick to try a new computer or communications technology, and am usually using it before any of my peers are.
- I’m well respected. I’m often one of the first in my area to use new computer or communications technologies. My colleagues often talk with me before using them.
- I’m careful and deliberate with my decisions. I often do use new computer or communications technologies, but I’m not usually one of the first to use them.
- I’m skeptical when it comes to using new computer or communications technologies. I will use them when I have to for my job, or when they become standard.
- I don’t use new computer or communications technologies. I prefer stability over change. Sometimes, I feel that I just don’t have the resources to invest in or learn new technology.

This part of the survey asks about you as a health educator.

29. Where do you work? _____

30. What is your position or job title? _____

31. What state/territory do you live in? _____

32. How would you describe your arena of practice?

- | | | | |
|--------------------------|--------------------------|--------------------------|--------------|
| <input type="checkbox"/> | Clinical/Health Care | <input type="checkbox"/> | Managed Care |
| <input type="checkbox"/> | Community Not-For-Profit | <input type="checkbox"/> | Research |
| <input type="checkbox"/> | Community For-Profit | <input type="checkbox"/> | School |
| <input type="checkbox"/> | Government | <input type="checkbox"/> | University |
| <input type="checkbox"/> | International | <input type="checkbox"/> | Worksite |

33. How long have you been in the field of health education?

- | | | | |
|--------------------------|------------------|--------------------------|---------------|
| <input type="checkbox"/> | Less than 1 year | <input type="checkbox"/> | 6 -10 years |
| <input type="checkbox"/> | 1 - 2 years | <input type="checkbox"/> | 11 - 15 years |
| <input type="checkbox"/> | 3 - 5 years | <input type="checkbox"/> | Over 16 years |

34. Please check any professional organizations you belong to:

- | | | | |
|--------------------------|---------|--------------------------|--|
| <input type="checkbox"/> | SOPHE | <input type="checkbox"/> | Local SOPHE chapter |
| <input type="checkbox"/> | APHA | <input type="checkbox"/> | State or local Public Health Association |
| <input type="checkbox"/> | ASTDPHE | <input type="checkbox"/> | AAHE |
| <input type="checkbox"/> | NCHEO | <input type="checkbox"/> | Other: |

35. What is your level of education?

- | | | | |
|--------------------------|------------------|--------------------------|-----------------|
| <input type="checkbox"/> | No college | <input type="checkbox"/> | Master degree |
| <input type="checkbox"/> | Some college | <input type="checkbox"/> | Doctoral degree |
| <input type="checkbox"/> | Bachelors degree | | |

36. Are you CHES certified?

Yes

No

37. Are you female or male?

Female

Male

38. What age group are you in?

I'm between 18 and 30
 I'm in my 30's
 I'm in my 40's
 I'm in my 50's

I'm in my 60's
 I'm in my 70's
 I'm in my 80's
 I'm 90 or over

This part of the survey asks you for references.

To protect your confidentiality, your name will not be released for any reason.

This study is using "snowball" sampling to find as many health educators as possible who are using the Internet. A snowball sample starts with a few people who meet the study criteria and asks them to refer others to the study.

39. Do you know any other health educators who are using the Internet?

Name	Agency	Phone or e-mail (if possible)

In the second component of this study, opinion leaders will be interviewed about their perceptions of the potential roles of the Internet in the field of health education. An opinion leader is a person who has technical competence in a certain area (in this case, the Internet), and is socially accessible, therefore influencing peoples' attitudes and behaviors.

40. Who do you consider to be an opinion leader with regard to the Internet?

Name	Agency	Phone or e-mail (if possible)

41. Do you consider yourself to be an opinion leader with regard to the Internet?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

42. Who do you consider to be an opinion leader in the field of health education?

Name	Agency	Phone or e-mail (if possible)

43. Do you consider yourself to be an opinion leader in the field of health education?

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No

Thank you for your time!

Would you like to receive a list of Internet resources for health educators?

Yes

No

May I include your "favorite resources" (question number 9) in this list?

Yes

No

Would you like to receive a list of names, e-mail addresses, and areas of interest of other health educators who are using the Internet?

Yes

No

Would you like to be included in this list?

Yes

No

Your name: _____

Your e-mail address: _____

Your area of interest: _____

Would you like to receive a summary of the results of this study?

Yes

No

How would you like this information sent to you?

E-mail file attachment
 Mail

Your e-mail address: _____

Your address: _____

If these documents were made available on the Web, would you be able to access them using FTP or a PostScript viewer/printer?

Yes

No

This information will be sent to you after the study has been completed.

Thank you again for participating in this survey!

Appendix F: Phase II Recruitment Script

“Hello, my name is Wendy Boman. I am a student in the MPH program at San Jose State University. I’m conducting research for my Master’s thesis on how health educators are using the Internet and the future potential of the Internet in our profession. My advisor is Dr. Kathleen Roe.

“I’m calling/sending you this e-mail because you were identified by your colleagues as an opinion leader in the field of health education/with regards to the Internet, and I’d like to know if you are interested in participating in the next phase of this study. This is the second of three phases, which explores the potential future roles of the Internet in our field. If you’d like to participate, I’ll ask to schedule a personal, phone, or email interview which will take about 30 minutes. I’m asking for participants to schedule an interview within the next two weeks.

“You are, of course, under no obligation to participate. While there is no monetary compensation, I’d be happy to share some resources with you as a way of thanking you for your time.

(For e-mail messages only) “If you’d like to participate, please reply to this e-mail and include convenient interview times, or you may call me at (408) 363-0354.”

(For phone calls only, if the subject would like to participate) “What would be a convenient time to schedule our interview?”

Appendix G: Phase II and III IRB Approval



San José State
UNIVERSITY

**Office of the Academic
Vice President**

**Associate Vice President
Graduate Studies and Research**

One Washington Square
San Jose, CA 95192-0025

Voice: 408-924-2480

Fax: 408-924-2477

E-mail: gstudies@wanoo.sjsu.edu

<http://www.sjsu.edu>

TO: Wendy Boman
5684 Herma St.
San Jose, CA 95123

FROM: Serena W. Stanford *Serena W. Stanford*
AAVP, Graduate Studies & Research

DATE: June 20, 1997

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"The Current and Potential Future Roles of
the Internet in Health Education Policy,
Research, and Practice"

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Serena Stanford, Ph.D., immediately. Injury includes but is not limited to bodily harm, psychological trauma and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

Appendix H: Phase II Consent Form

College of Applied Sciences and Arts • Department of Health Science
One Washington Square • San José, California 95192-0052 • 408/924-2970

Agreement to Participate in Research

Responsible Investigator: Wendy Boman

Title of Protocol: The current and potential future roles of the Internet in health education policy, research, and practice—Phase II: The potential roles of the Internet in health education.

Please read this agreement carefully.

1. I have been asked to participate in a research study investigating the current and potential future roles of the Internet in health education policy, research, and practice.
2. I will be asked to participate in a phone, online, or personal interview which asks my opinions about the potential roles of the Internet in health education. The interview will be conducted at my convenience in June 1997, and will take about 30 minutes.
3. I understand that there are no risks anticipated for participating in this study.
4. I understand that there are no direct benefits anticipated from participating in this study.
5. I understand that the results of this study may be published, but no information that could result in my identification will be released.
6. As compensation for my time, I will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary of the results of this study. These will be sent to me upon completion of this research.
7. If I have any questions about this study, I can contact the principal investigator, Wendy Boman, at (408) 363-0354. I can contact the Chair of the Health Sciences Department, Dr. William Washington, at (408) 924-2970 if I have any complaints about this study. If I have questions or complaints about this study, subjects' rights, or research-related injury, I can contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.
8. I understand that if I do not want to participate in this study, my decision will not jeopardize any services that I am otherwise entitled to.
9. Participation in this study is voluntary. I may refuse to participate in this study, or any part of this study. If I decide to participate, I am free to withdraw at any time, without affecting my relationship with San Jose State University.
10. I can received a signed and dated copy of this consent form upon request from the researcher.

Your verbal agreement means that you have agreed to participate in this research.

The signature of the principal investigator means that the investigator has agreed to include you in this study and has fully informed you of your rights.

Your signature/verbal agreement

Date

Investigator's signature

Date

Appendix I: Phase II Interview Guide

I'm going to read a brief statement that summarizes this research and what you'll be asked to do. Then, I will read through the Agreement to Participate in Research form that I've sent you through email. After we read through this Agreement, I will ask if you agree to participate in this study. Do you have any questions?

I need your help in conducting a study of the potential roles of the Internet in health education policy, research, and practice. I am conducting this research as a part of my Masters thesis. The purpose of this research is to gather opinions and perceptions of health educators who are using the Internet. The results of this study should help individual health educators and health education professional organizations understand the potential benefits, risks, and barriers to using this new technology as we prepare to enter the new millennium.

The second phase of this study is an exploration of the potential roles of the Internet with selected opinion leaders in the field. This interview will be guided by a set of nine questions asking about your opinions as to the potential roles of the Internet in health education. At the end of the interview, I will ask a series of eight demographic questions. This interview should take about 30 minutes.

As we discussed previously, your participation is voluntary. Choosing not to participate in this study, or in any part of this study, will not affect your relations with San Jose State University.

The results of this study may be published, but any information that could result in your identification, including your name and the agency you work for, will remain confidential.

Although you may not benefit from participating in the survey itself, you will have the opportunity to learn about resources that may be helpful to you. You will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary report of the results of this study. I do not anticipate that you will face any risks by participating in this study.

If you have any questions about this study, I will be happy to talk with you. I can be reached at (408) 363-0354, or via e-mail at wendybs@ix.netcom.com. If you have questions or complaints about research subjects' rights, or in the event of a research related injury, please contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.

[Read Agreement to Participate in Research]

I would like to ask your permission to tape record this interview. The tape will be destroyed after this study is completed. Do you have any objection to tape recording?

This part of the interview asks about your vision for the Internet in health education.

1. How do you see the Internet's current role in the field of health education?
 - As a tool for communication and collaboration within the profession?
 - As a tool for communication and collaboration among professions?
 - As a means of providing health education?
2. How do you see the Internet coming into play in the field of health education over the next ten years?
3. What unique contributions do you see the Internet making in our field?
4. What do you see as some of the advantages of this vision of the Internet's role in health education?
5. What do you see as some of the disadvantages and risks? What might we be leaving behind in our rush to embrace this new technology?
6. In your opinion, how can we adopt the positive characteristics of the Internet while minimizing the risks?
7. What do you think are some of the barriers keeping health educators from using the Internet?
8. What do you think needs to happen to overcome these barriers? How might we strengthen the system linking those with the knowledge and resources to those who would like to learn to use the Internet?
9. How do you see the Internet coming into play in the current key issues in our profession?
 - SOPHE's strategic planning:
 - Graduate competencies and standards of practice:
 - CHES certification (especially with regards to providing health education via the Internet):
10. Who do you identify as the key informants with regards to these three key issues?

This part of the survey asks about you as a health educator.

11. What state/territory do you live in? _____

12. How would you describe your arena of practice?

<input type="checkbox"/>	Clinical/Health Care	<input type="checkbox"/>	Managed Care
<input type="checkbox"/>	Community Not-For-Profit	<input type="checkbox"/>	Research
<input type="checkbox"/>	Community For-Profit	<input type="checkbox"/>	School
<input type="checkbox"/>	Government	<input type="checkbox"/>	University
<input type="checkbox"/>	International	<input type="checkbox"/>	Worksite

13. How long have you been in the field of health education?

<input type="checkbox"/>	Less than 1 year	<input type="checkbox"/>	6 -10 years
<input type="checkbox"/>	1 - 2 years	<input type="checkbox"/>	11 - 15 years
<input type="checkbox"/>	3 - 5 years	<input type="checkbox"/>	Over 16 years

14. Please check any professional organizations you belong to:

<input type="checkbox"/>	SOPHE	<input type="checkbox"/>	Local SOPHE chapter
<input type="checkbox"/>	APHA	<input type="checkbox"/>	State or local Public Health Association
<input type="checkbox"/>	ASTDPHE	<input type="checkbox"/>	AAHE
<input type="checkbox"/>	NCHEO	<input type="checkbox"/>	Other:

15. What is your level of education?

<input type="checkbox"/>	No college	<input type="checkbox"/>	Master degree
<input type="checkbox"/>	Some college	<input type="checkbox"/>	Doctoral degree
<input type="checkbox"/>	Bachelors degree		

16. Are you CHES certified?

Yes No

17. Are you female or male?

Female Male

18. What age group are you in?

<input type="checkbox"/>	I'm between 18 and 30	<input type="checkbox"/>	I'm in my 60's
<input type="checkbox"/>	I'm in my 30's	<input type="checkbox"/>	I'm in my 70's
<input type="checkbox"/>	I'm in my 40's	<input type="checkbox"/>	I'm in my 80's
<input type="checkbox"/>	I'm in my 50's	<input type="checkbox"/>	I'm 90 or over

Appendix J: Phase III Consent Form

College of Applied Sciences and Arts • Department of Health Science
One Washington Square • San José, California 95192-0052 • 408/924-2970

Agreement to Participate in Research

Responsible Investigator: Wendy Boman

Title of Protocol: The current and potential future roles of the Internet in health education policy, research, and practice—Phase III: Validation.

Please read this agreement carefully.

1. I have been asked to participate in a research study investigating the current and potential future roles of the Internet in health education policy, research, and practice.
2. I will be asked to participate in an online chat session which asks my opinions about the findings and recommendations of this research. The chat session will be conducted during the week of June 23, 1997. I can participate at my convenience.
3. I understand that there are no risks anticipated for participating in this study.
4. I understand that there are no direct benefits anticipated from participating in this study.
5. I understand that the results of this study may be published, but no information that could result in my identification will be released.
6. As compensation for my time, I will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary of the results of this study. These will be sent to me upon completion of this research.
7. If I have any questions about this study, I can contact the principal investigator, Wendy Boman, at (408) 363-0354. I can contact the Chair of the Health Sciences Department, Dr. William Washington, at (408) 924-2970 if I have any complaints about this study. If I have questions or complaints about this study, subjects' rights, or research-related injury, I can contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.
8. I understand that if I do not want to participate in this study, my decision will not jeopardize any services that I am otherwise entitled to.
9. Participation in this study is voluntary. I may refuse to participate in this study, or any part of this study. If I decide to participate, I am free to withdraw at any time, without affecting my relationship with San Jose State University.
10. I can receive a signed and dated copy of this consent form upon request from the researcher.

Your verbal agreement means that you have agreed to participate in this research.

The signature of the principal investigator means that the investigator has agreed to include you in this study and has fully informed you of your rights.

Your signature/verbal agreement

Date

Investigator's signature

Date

Appendix K: Phase III Discussion Guide

College of Applied Sciences and Arts • Department of Health Science
One Washington Square • San José, California 95192-0052 • 408/924-2970

Dear health education colleague,

I need your help in conducting a study of the potential roles of the Internet in health education policy, research, and practice. I am conducting this research as a part of my Masters thesis. The purpose of this research is to gather opinions and perceptions of health educators who are using the Internet. The results of this study should help individual health educators and health education professional organizations understand the potential benefits, risks, and barriers to using this new technology as we prepare to enter the new millennium.

The third phase of this study presents the research findings and recommendations to a group of selected opinion leaders in the field of health education for feedback and validation. The research findings and recommendations will be posted for discussion, along with some questions to guide this discussion, in a chat room on the HEDIR home page during the week of June 23rd, 1997. If you agree to participate in this chat group, you will be asked to read and contribute to this discussion at your convenience during this week.

As we discussed previously, your participation is voluntary. Choosing not to participate in this study, or in any part of this study, will not affect your relations with San Jose State University.

The results of this study may be published, but any information that could result in your identification, including your name and the agency you work for, will remain confidential.

Although you may not benefit from participating in the survey itself, you will have the opportunity to learn about resources that may be helpful to you. You will be able to receive a list of Internet resources for health educators, join and/or receive a list of other health educators using the Internet, and receive a summary report of the results of this study. I do not anticipate that you will face any risks by participating in this study.

If you have any questions about this study, I will be happy to talk with you. I can be reached at (408) 363-0354, or via e-mail at wendybs@ix.netcom.com. If you have questions or complaints about research subjects' rights, or in the event of a research related injury, please contact Serena Stanford, Ph.D., Associate Academic Vice President for Graduate Studies and Research, at (408) 924-2480.

Thank you for your time.

Sincerely,

Wendy Boman
Graduate Student/Principal Investigator

Thank you for agreeing to participate in this final phase of research on the current and potential future roles of the Internet in health education.

The purpose of this chat session is to present the research findings and recommendations to a selected group of opinion leaders in health education, and to elicit your feedback.

Please read the summary of findings and recommendations, and join the other chat participants in a discussion based on the following questions:

1. How do these findings support or contradict your own experience with how the Internet is coming into play within the field of health education?
2. Do you feel that the recommendations made are supported by the findings?
3. Are there other recommendations you would make based on these findings?

Please introduce yourself to the other chat participants. To protect your confidentiality, your name and other identifying information will not be used in conjunction with your comments in the reporting of this research.

If you have not already participated in Phase I or Phase II of this research, please answer the following demographic questions:

4. What state/territory do you live in? _____

5. How would you describe your arena of practice?

<input type="checkbox"/>	Clinical/Health Care	<input type="checkbox"/>	Managed Care
<input type="checkbox"/>	Community Not-For-Profit	<input type="checkbox"/>	Research
<input type="checkbox"/>	Community For-Profit	<input type="checkbox"/>	School
<input type="checkbox"/>	Government	<input type="checkbox"/>	University
<input type="checkbox"/>	International	<input type="checkbox"/>	Worksite

6. How long have you been in the field of health education?

<input type="checkbox"/>	Less than 1 year	<input type="checkbox"/>	6 -10 years
<input type="checkbox"/>	1 - 2 years	<input type="checkbox"/>	11 - 15 years
<input type="checkbox"/>	3 - 5 years	<input type="checkbox"/>	Over 16 years

7. Please check any professional organizations you belong to:

<input type="checkbox"/>	SOPHE	<input type="checkbox"/>	Local SOPHE chapter
<input type="checkbox"/>	APHA	<input type="checkbox"/>	State or local Public Health Association

<input type="checkbox"/>	ASTDPHE
<input type="checkbox"/>	NCHEO

<input type="checkbox"/>	AAHE
<input type="checkbox"/>	Other:

8. What is your level of education?

<input type="checkbox"/>	No college
<input type="checkbox"/>	Some college
<input type="checkbox"/>	Bachelors degree

<input type="checkbox"/>	Master degree
<input type="checkbox"/>	Doctoral degree

9. Are you CHES certified?

<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
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10. Are you female or male?

<input type="checkbox"/>	Female	<input type="checkbox"/>	Male
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11. What age group are you in?

<input type="checkbox"/>	I'm between 18 and 30
<input type="checkbox"/>	I'm in my 30's
<input type="checkbox"/>	I'm in my 40's
<input type="checkbox"/>	I'm in my 50's

<input type="checkbox"/>	I'm in my 60's
<input type="checkbox"/>	I'm in my 70's
<input type="checkbox"/>	I'm in my 80's
<input type="checkbox"/>	I'm 90 or over

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