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AUTHOR Freud, Robert
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ABSTRACT

Community colleges should consider the advantages of providing Internet access to students, faculty, and non-teaching staff. Connecting more than 30 million users around the world, the Internet is a network of computer networks which allows people to send messages and retrieve files from users around the world. The World Wide Web, accessed via the Internet, is a set of software tools that allows users to access hyper-text linked information. One of the advantages of Internet access over audio and video courses associated with distance learning is its interactive capacity through electronic mail, as well as the ability to integrate audio, video, text, and graphics in one lesson. Although community colleges make use of computers in nearly twice as many courses as do four-year institutions, many schools still provide only limited access. Yet, the Internet has the potential to encourage significant cost savings through the efficient sharing of resources and to generate new revenue sources through distance learning courses. Other advantages of the Internet include opportunities to enhance public relations, student recruitment, faculty development, and students' critical thinking skills in that they must evaluate information they find; provide teachers with a learning experience that helps them empathize with students; encourage student-teacher communication; and encourage a sense of community at the college. Drawbacks of Internet access are the potential of plagiarism among students and the costs of upgrades. (TGI)

Community Colleges and the Virtual Community

Mid-Career Fellowship Program
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Written By

Robert Freud
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Issues of Education at Community Colleges: Essays by Fellows in the Mid-Career Fellowship Program at Princeton University

Robert Freud HIS 520

Community Colleges and the Virtual Community

"Any sufficiently advanced technology is indistinguishable from magic." Arthur C. Clarke's Third Law from *Profiles of the Future: An Inquiry into the Limits of the Possible*

Maria checks her e-mail before leaving for class. She finds three different responses from members of her study group to her question about last night's calculus problem as well as an invitation to coffee from a friend and a missive from her French teacher, M. Atget. The message asks if she can stop by during an office hour this week to discuss her most recent test on the *Pasée Composé*. The cup of coffee in the student center is real; the office hour is virtual--Maria attends a community college in New Jersey, and her French teacher is located in Paris.

Today, college professors in some virtual courses meet their students rarely or not at all as an increasing number of schools offer credit and noncredit courses over the Internet. In Manhattan, for example, the New School offers both Business Chinese and Astronomy on-line. At present, electronic courses offered by the New School are text-based: The instructors' lecture notes are posted (made available on the Internet), students complete assignments by e-mail, and a "virtual" classroom bulletin board exists for discussion. At the other end of the spectrum, the University of Toronto offers a course called Creativity, whose students can attend the course in Toronto or from another location, via the In-

ternet. All of the instructor's lectures can be heard over the Internet with a home computer connected to a modem.

A recent Internet educational project focused on an Egyptian archaeological excavation. Although the course was geared for primary and secondary school students, it was technologically more impressive than the college courses mentioned above. Week by week, results of the expedition and photographs of new finds were posted on the Internet. Using e-mail, students wrote questions to the scientists participating in the dig. An interview by a scientist of a Bedouin family was posted on-line. On this dig, an important and unexpected discovery of a new set of burial chambers was immediately shared with the participating Internet students.

In addition to the educational advantages, knowledge of the Internet is desirable for job seekers. In a recent survey of 150 executives of top companies conducted by Robert Half International, 61 percent of those questioned indicated that Internet savvy would make an individual a more desirable candidate for employment; 76 ercent of the respondents thought that knowing how to use the Internet would be important for career advancement in another five years.[1] Yet fewer than half of the community colleges in the United States have a presence on the Internet. My purpose in this paper is to suggest that community colleges should consider the advantages to students, faculty, and nonteaching staff of Internet access. These advantages include but are not limited to the vast number of on-line resources available in most subject areas. The public awareness and acceptance of the Internet that has occurred during the 1990s points to important changes in the way information will be disseminated in the near future, to changes in education, and to important cultural changes as well.

Background on the Internet: What Is It?

The Internet today connects more than 30 million users around the world. As its name implies, the Internet is a network of computer networks. A good analogy may be that of telephone service: A caller in North Carolina whose phone service is provided by Southern Bell can talk with someone in New York whose service is offered through NYNEX. In the same way, people who have Internet accounts on one network can send messages to and retrieve files from users on other networks around the world, regardless of the type of computer operating system being used. As is the case with the telephone analogy, such integration is "seamless" in that users need not be aware of the technology in order to make use of it.

The origins of the Internet date back to a U.S. government project called the ARPANET (Advanced Research Projects Agency Network), developed in 1969 to create an emergency computer network in the event that an act of war, for example, shut down traditional lines of communication. However, it was the advent of an easy-to-use graphical user interface (GUI) in 1993 known as Mosaic that enabled many people to use the Internet without having to learn the UNIX operating system, which previously was necessary for most Internet applications.

Today the World Wide Web has become synonymous in the minds of most people with the Internet. The World Wide Web (WWW) is a set of software tools that allows users to access hypertext-linked information. Under the hypertext system, information is linked so as to enable the user/reader, rather than the author/creator, to determine the path through the information. (The help system in Windows-based computers is

a hypertext system familiar to many people who use the Windows operating system.) The idea of hypertext is similar to that of "interactive" children's books which encourage the child to read a section of the story and then decide what happens next.

Distance Learning: Benefits of Multimedia Hypertext

Those readers who have not themselves used the World Wide Web will be at a disadvantage for what follows. But let me state that the Internet as accessed via the WWW has many advantages over the video or audio courses that many people associate with distance learning. When well designed, educational materials delivered over the Internet *are* interactive: The student receives feedback and has the ability to ask questions as well as to control the speed of the delivery of the material. For those courses that are recorded and delivered using a combination of text, audio, and video, a significant portion of this interaction today comes about in the form of e-mail. Students may post questions to the instructor, to other students, and to people around the world who are in some way involved with the topic being studied. One of the most powerful educational benefits of the Internet is its ability to integrate audio, video, text, graphics, and interactive elements in one lesson. Students studying art history, for example, may visit a museum on-line, see high-quality scanned images of paintings, listen to a lecture, watch a video, ask questions of an instructor or docent, and discuss with one another what they are viewing and studying. Making use of *shared white board* technology can enable learners to collaborate in real time on a drawing or jointly to evaluate an article. Discussions in which participants may

see one another are possible, although at present the available technology is primitive compared with the standards of broadcast television.

Today very few people are untouched by the Internet and the Web, and this is likely to become even more true in the near future. Even those who do not use a computer are likely to benefit from Internet technology. A client who contacts a real estate agent for listings in another state, for example, will probably be presented with a customized list and perhaps photographs downloaded from the Net. A patient may receive treatment based on information a doctor sought and found while searching the Net. Stockbrokers use the Net not only to check quotes but also to conduct video conferences to discuss emerging issues relevant to their clients' portfolios.

Although it might appear that the Internet is merely the mood ring of the 1990s, important evidence supports the idea that it will be a leading player in the immediate future and probably for much longer. One of the best indicators of this is the fact that new computers are now being sold with pre-installed Internet software and hardware. Several computer companies (Microsoft, for example) have even developed their own networks (MSN, the Microsoft Network). Additional evidence is the competitive pricing being offered for Internet access ($15-$20 per month for unlimited home Internet access). There is also an incentive for hardware companies to develop low-end workstations that can connect to the Internet those families or businesses that want access to the Net for information but do not need computing power.

Although it is difficult to determine precisely when the general public became aware of and "accepted" the Internet, certainly the Internet is no longer, as it once was, the exclusive tool of computer science de-

partments in four-year colleges. Not only is it accessible to the general public, but it has become the current darling/devil of the mass media and has spawned among other things a tremendous publishing initiative in books to teach people how to use this tool.

Community College Access to the Internet

Community colleges have certainly not avoided computer technology. A study conducted by the Technology, Teaching and Scholarship Project at the University of Southern California revealed that community colleges make use of computers in nearly twice as many courses as do four-year institutions.[2] Yet community colleges today vary widely in their use of the Internet and in the access they provide to faculty, students, and staff. Many schools provide merely limited access, and this only for faculty. According to statistics from the American Association of Community Colleges, the United States has 1,100 junior and community colleges.[3] Of these, it is estimated, fewer than half have a presence on the World Wide Web.[4] Schools that do not have a public Web server may, however, provide varying levels of Internet access to their faculty, staff, and students. Typically some schools may provide their faculty with e-mail capabilities but not with the ability to access WWW pages or construct and post their own pages.

How the Internet Can Benefit Community Colleges

Schools in general, and community colleges in particular, can derive many benefits from making Internet access available to their publics. Of perennial importance, of course, are economic questions. The Internet has the potential to encourage significant cost savings and the poten-

tial to generate new revenue sources. As schools find ways to collaborate using the Internet, they can share resources efficiently. Where educationally sound, the judicious use of distance learning may enable schools to stretch limited budgets by reaching students with courses that go beyond the interactive television (ITV) of today. Schools will thus realize a savings in terms of physical resources, instructional resources, or both.

Enhancing Public Relations for Community Colleges

Far more than other institutions of higher learning, community colleges are dependent upon public perception, and this public perception translates very directly into funding. This dependence also affects the number of students who enroll. Given that newspapers are disinclined to publish anything that is not hard news, a community college's World Wide Web site can be a highly effective way to reach the public. In order to use the Net this way, a computer-literate public must be attracted to a school's host site on a continuing basis. As many Web designers have discovered, the site must provide more than a well-designed advertisement. Users must receive true value of some sort; they must be intrigued enough to resist immediately jumping to another link somewhere else in cyberspace. An often-quoted dictum for potential Web authors is that on the Internet, at least, "content is king."

Internet and Recruitment

E-mail accounts and Internet access have been standard benefits provided to students studying at four-year institutions for most of the 1990s. Now students trying to decide which college to enroll in might

decline to consider those that do not provide such Internet access; indeed, they may in fact take level of Internet access--if any--into their decision-making process. Students interested in attending Mercer Community College, for example, can click on a WWW link to receive information about the school. Students interested in a particular department can access another link to have someone from that department contact them by phone or e-mail with more information about the area they are interested in studying.

Faculty Development

Although reduced educational funding makes conference attendance prohibitively expensive for many community college faculty because of travel costs, participation in virtual sharing is free or inexpensive. At community colleges, a teacher may find her/himself one of a very few people who share a given academic discipline. Because of heavy teaching loads, some teachers find it burdensome to keep up to date in their fields. With Internet access, teachers can enter into subject-area discussions from their home or office computers and can peruse many of the latest journals on-line. Software appropriate for their discipline often is made available free of charge over the Internet. Many professional organizations, such as the American Philosophical Association and Teachers of English to Speakers of Other Languages, host WWW sites with links of interest to their members. The Teachers of English to Speakers of Other Languages has been particularly active on the Internet. A daily e-mail discussion group for these teachers is one of the ten most widely subscribed of such groups, with more than 10,000 people registered. Though community college libraries may be reluctant to subscribe to cer-

tain professional journals that will be read by a very limited number of faculty, free electronic versions of many professional publications are becoming more and more the norm.

Teaching Critical Thinking

> "I believe that it is a myth that the more choices you have, the more appropriate actions you can take and the more freedom you will enjoy. Rather, more choices seem to produce more anxiety. . . . I have a theory that this is why Chinese food is always shared among diners. To somewhat reduce the anxiety of having to make a decision from so many choices, diners have access to everyone else's selection, to make a poor choice less distasteful." Richard Saul Wurman, *Information Anxiety*

The resources of the Internet are vast and impressive--and without any kind of central organization. It is easy to find information on almost any topic, but students must use critical thinking to evaluate the information they find. For example, there is likely to be a difference in accuracy and quality between information gleaned from a discussion on the alt.religions newsgroup (an open forum on all aspects of religion) and that from, say, the Dartmouth University Glossary of World Religions.

The resources of the Internet are different from those of libraries in that library collections have been well indexed by professionals. While the Internet has given everyone and anyone the equivalent of a printing press, enabling them to disseminate information on-line, the search engines (software programs designed for searching databases) have

yet to catch up with the information outpouring. For example, a search of AltaVista, one of the most popular search engines, turns up more than one million references to teaching. If I ask for information on "Internet " more than eight million references are located in seconds. Performing a Boolean search for "Internet" and "teaching" narrows the number to a more manageable 700,000. The key word "China" brings up 200,000 potential leads. The key word "biology" brings up approximately 400,000 hits. Asking for references to the Arthur C. Clarke quote that heads this paper brings up more than 200 hits. Students will now need instruction both in reference techniques applicable to this new medium and in evaluating materials for relevance, authority, and applicability.

At a recent technology conference, the person responsible for designing the catalog for one of the five most popular search engines said that her company indexed only the title headings and first few paragraphs of Web pages that are included in their database. Given that the first paragraphs of many documents are often not descriptive of what follows, the number of "false" hits one will encounter when using such a search engine is great. Some have said that the task of librarians in the past was to help patrons find information; in the age of the Internet, their task is to help patrons avoid irrelevant information and to keep users from drowning in the sea of possible references.

Cultural Change

Foreign language teachers are often encouraged to study a new language every few years, if for no other reason than to help them empathize with the task facing their students. One might view the educational process as being composed of two distinct camps: those who know

(the teachers) and those who don't know (the learners). It is easy for those who know to forget how frustrating and difficult learning can be. This is not to suggest that the nature of the educational endeavor is intrinsically adversarial; however, introduction of the new technologies may provide some leveling of the emotional playing field ordinarily found in the classroom.

With the migration of important educational resources to the Internet, students and teachers are on the same footing with regard to the new technology. Few know this new technology completely. Almost everyone is disenfranchised as a novice computer user. Even those who know how to word process and send e-mail must go through a learning process when facing the Internet. New vocabulary (URL, http, anonymous ftp) and new concepts (hypertext, Boolean search, web-browser plug-in) confront most users initially. It is reasonable to assume that many teachers who are presently working and all new teachers will need to embrace the emerging technologies. All teachers will realize a valuable benefit if they remember their initial frustrations and difficulties with the Internet and are able to preserve a measure of empathy for what their students go through on a daily basis.

Drawbacks of the Internet

In addition to concerns that students will spend all their time on the Internet aimlessly "surfing" or playing worldwide multi-user games of "Doom," many teachers have expressed concern that the ability of students to download massive amounts of text that may be easily imported into word processing documents may unduly tempt those who see deadlines approaching. The detection of such plagiaristic efforts is, in fact,

easier when students use material "lifted" from electronic sources. Teachers have always looked for differences in writing style. Many instructors can relate stories of having seen papers in which an initially clumsy introductory paragraph is followed by three well-written pages and then summed up by an equally awkward conclusion. If one suspects that material has been copied from an electronic source, it might be that the student whose paper is being questioned used one of the standard search engines to locate that material and used it verbatim. Using a search engine like AltaVista (which, unlike the unnamed service mentioned previously, indexes every word of every document available through it), one merely enters a suspect phrase or sentence. If it appears in a document indexed by AltaVista, the entire article will instantly be available, saving a teacher much effort trying to track down possible sources of plagiarism.

Also of concern is the fact that although the Internet offers means for generating additional revenue and maximizing use of scarce resources, users, in order to access the Internet via a browser such as Netscape or Mosaic, will need access to higher-end computers than are often generally available at many community colleges. While computers with 386 processors and 4 megabytes of RAM may be fine for word processing and working with spreadsheets, 486 machines with at least 8 megs of RAM are really a minimum recommendation for WWW users. Upgrading to these machines will be an expense over and above the cost of securing an Internet connection.

Encouraging Student-Teacher Communication

The experience of many community college faculty is that students are reluctant to partake of office hours unless specially urged to do so or until they discover that they are failing their courses. The two-way communication provided by an e-mail system changes the nature of the student-teacher dialogue. Students with questions post them to their teachers, to study groups, or to a UseNet newsgroup (UseNet newsgroups are the 10,000 to 15,000 e-mail discussion groups hosted on the Internet on nearly every topic imaginable). Students may contact the instructor of a class they are considering taking to find out more about the class; they may also check the previous semester's online syllabus, course guide, and practice tests if these have been posted on-line as many professors are now doing. Some faculty may encourage students to submit first drafts of important assignments by e-mail and then return these with voice or text annotations.

Encouraging Community at Community Colleges

It is ironic that one of the things often missing at many community colleges is a true sense of community among the students. No one is at fault; almost all such schools function on a commuter basis. Providing students with access to e-mail and Internet accounts that they will want to check frequently may have the potential to help establish some sense of community. At Gainesville College, for example, in order to check their e-mail students must pass through an electronic bulletin board upon which appear notices of current interest: sporting activities, plays, trips, concerts, and the like. Although students may ignore these

as easily as we ignore television advertisements (or do we?), well-designed, graphically interesting notices will attract students' notice and, perhaps, encourage them to participate in activities that might otherwise have gone unnoticed.

Without minimizing the very real technological, financial, and educational concerns about making Internet access available to community college students, faculty, and staff, the potential benefits appear to outweigh the drawbacks.

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[1] "Know thy net, survey suggests." *The Bergen Record*, 3 June 1996, p. B-1.
[2] Cross, Carol, "Community colleges lead in classroom use of computers, survey shows." *Black Issues in Higher Education*, 12 January 1995.
[3] http://www.aacc.nche.edu/membrshp/aaccfact/htm. *1995 AACC Facts*. The American Association of Community Colleges.
[4] http://www.mcli.dist.maricopa/edu/cc. *Community College Web*.