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An Overview of the Hardware, Software and Technical Support Needed to Teach/Learn in A Text-Based Networked Learning Environment

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INTRODUCTION

Text-based networked learning (NL) happens when "computers are used to exchange information and access resources" (Haughey & Anderson, 1998, p. 3). The teaching/learning endeavor relies heavily on the use of the Internet through e-mail communication, computer conferencing, and web activity. This paper presents the hardware and software capabilities of these three NL methods and the technical infrastructure needed to successfully support the teaching and learning environment.

ANALYSIS

1. Email

Email is a simple text based communication feature, which connects two computers electronically through a hardware device known as a modem [see glossary]. The process happens when "the sending computer's modem modulates the computer's digital signals into analog signals that pass over a phone line. The receiving computer's modem demodulates the analog signal back into the digital signal that the computer's software converts into text" (Chute, Thompson, & Hancock, 1999, p. 41). "Modem speeds are expressed in terms of baud rate (bits per second) and the higher the baud rate, the faster the modem connection" (Chute, et al, 1999, p. 41). Once the message is composed and received, it can be read, downloaded, stored, or forwarded.

2. Computer Conferencing

Computer conferencing extends the features of email by increasing interaction for group learning. Interactive messaging supports two way communication where an individual types a message on the computer screen and the message appears on the screens of all other members of the group (Perrin & Mayhew, 2000). Functions include the management of group membership lists, the efficient distribution of messages to group members, and the storage and retrieval of prior interactions (Perrin & Mayhew, 2000). "Learning management platforms [see glossary] enhance student access to learning materials, integration of multimedia content and a range of student interaction and tracking services"(Chute, et al, 1999, p. 43).

3. Web (WWW) Activity

The World Wide Web is a component of the Internet [see glossary] consisting of client and server computers that store multimedia documents through a communication standards, called HTTP: Hyper Text Transfer Protocol [see glossary] (Chute, et al, 1999, p. 43). The client computer uses software packages called browsers [see glossary] to view multimedia document, and the server computer uses server software to maintain documents for clients to access. All documents are addressed with a uniform resource locator referred to as a URL (Haughey & Anderson, 1998). The Web has hypermedia capabilities, which allows for the transferring of data, graphics, sound, and video. (Haughey & Anderson, 1998).

Technology Infrastructure and Support

Learners and instructors need both reliable equipment and available support to succeed in text based networked learning. According to Bates (2000) the technology infrastructure of this environment consists of two elements: (1) *Physical Infrastructure*: the hardware and software that connect the machines and networks that enable them to work and (2) *Human Infrastructure*: the staff members that support the technology and ensure that the networks and equipment are properly installed, operated, updated and maintained (p. 87).

Learner:

In order to access the NL environment, a student must have a PC, a modem and an Internet connection. The PC must runs on an operating system equipped with a Web browser software that reads JAVA script [see glossary] (Perrin & Mayhew, 2000). Access to email requires a connection with an Internet service provider (ISP). Home users who "purchase an ISP receive four essential services: 1.) A telephone line. 2.) An email address 3.) A password and 4.) A helpline and customer support service" (Haughey & Anderson, 1998, p.17).

Cable modem speeds are either 28.kps to 33.6 kps and suffice for text based classes. However, high-speed internet access with more bandwidth [see glossary] are necessary for those student who want faster downloads or are involved in multimedia-heavy web courses featuring streaming video or live lectures" (Kumiko & Pogroszewski, 1988, p. 60). "Besides the initial connection, a student needs software applications [see glossary] that provide ways and tools to help interact with other users and find and use Internet resources" (Haughey & Anderson, 1998, p.17).

Most software vendors provide online tutorials and technical support pages that students can use as a resource in online learning (Perrin & Mayhew, 2000). Institutional manuals that lists equipment and software requirements, as well as traits and abilities necessary for what it take to be a distant learner also help student succeed in the learning process. A good online orientation package can ultimately "incorporate institutional-wide information about the technology infrastructure, as well as access to the library, the campus bookstore, and other student support services" (Saba, 1999, para 8). However, to further support student's technical questions "regarding access codes, connectivity problems, hardware specifications etc, at best, a computer help desks should be made available 24 hours a day, 7 days a week" (Kumiko & Pogroszewski, 1998, para. 28).

Institution:

Many institutions host proprietary distance learning programs on a private Intranets [see glossary]. To provide quality assurance, special access privileges are set up to connect with technical infrastructure, and are designed and supported by a team of experts. "A firewall [see glossary] forms boundaries between networked computers and protects the computers Internet connection. PC's within the firewall are on a secure subnet with internal access capabilities to share resources (Chute, et al, 2000, p.52). Furthermore, devices called proxy servers [see glossary] are housed on a central computer system within the organization and manage the links among other computers making e-mail and chat lines possible (Roberts, Brindley, and Spronk, 1998, p. 34)

Project management of these systems requires the coordination of three organizational functions: business functions, information systems functions and training functions (Perrin & Mayhew, 2000). Instructors need to be trained and "receive technical support in servicing equipment, software, media production and instructional design" (Bates, 2000, p.121). Technical staff must be available for the creation and application of educational materials and instructional design staff must further support course development and instructional need. Together, they assist the subject matter expert in designing quality instruction within the confines of available communication and delivery technologies (Chute et al., 1999).

According to Bates, (2000) there are five essential factors that work best in creating a positive atmosphere for institutional development and support. 1.) A strategic plan from the supporting institution. 2.) Extensive investment in technology infrastructure. 3.) Overall support from leadership for the use of technology in teaching. 4.) Support, in a wide variety of ways, to faculty that use technology in teaching. 5.) Support to students through computer access, Internet accounts, and financial support (p.99). He concludes that training and support at the institutional level is essential for successful learning and teaching. "A strategic technology plan must be implemented so that faculty and students do not continually have to change machines, operating systems, Internet service providers, and so on (Bates, 2000, p. 89).

CONCLUSION

With the proper technological infrastructure and support, text based networked learning has many advantages. Overall, the flexibility and convenience of this environment provide a cost-effective, time-efficient distance learning solution for both learner and institution. However, the preceding review suggests that having the proper equipment alone is not enough to guarantee an effective learning experience. It is equally important to receive ongoing training and support on how to properly maintain and use the technologies that represent the learning process.

GLOSSARY:

Bandwidth: "the measure of the capacity of information that can be transmitted over a channel of communication" (Haughey & Anderson, 1998, p.150).

Browser: "the client program used to retrieve and display information from a WWW server program. The most popular browsers are distributed by Netscape Corporation" (Haughey & Anderson, 1998, p.150).

Firewall: "a combination of hardware and software tools that provide security to a site allowing

and resisting certain information" (Haughey & Anderson, 1998, p.151).

HyperText Transfer Protocol: common protocol on the Internet that links and locates materials (Chute, Thompson, & Hancock, 1999).

Internet: "a network of networks that uses a common protocol (TCP/IP) and addressing scheme to share resources. URL (Uniform Resource Locator) is the address of Internet – based resources" (Haughey & Anderson, 1998, p.151).

Intranet: "an Intranet is a network of servers and computers within an organization which uses Internet and programs" (Robert, Brindley, and Spronk, 1998, p. 34).

JAVA Script: a computer language designed to run with a WWW browser (Chute, Thompson, & Hancock, 1999).

Learning Management System: "a networked based software program that allows multiple users to interact through threaded discussions or text-based messaging in delayed time or real-time communication" (Chute, Thompson, & Hancock, 1999, p. 43).

Operating System: "Software, such as Windows 98, that runs your computer; controls software applications and hardware programs. *Software Applications:* the programs that work with the computer to perform specific tasks such text documents, graphics, or spreadsheets. *Hardware programs:* the electrical and mechanical component of a PC system" (Chute, Thompson, & Hancock, 1999, p. 41).

Modem: "a hardware device that lets computers communicate over standard phone lines; assists with the exchange of files or electronic mail" (Haughey & Anderson, 1998, p.151).

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