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Use and Documentation of Electronic Information: A Survey of Eastern Regional Technology Education Collegiate Association Students

by Hassan Ndahi

Introduction

Computer technology is rapidly changing how students access and disseminate information. The idea that technology will make information quickly available to the individual goes back to the early days of the computer, which began with punch-card technology in 1890 and continues with the use of integrated circuits and the revolution of the personal computer in the late 1970s (Stephenson, 2002). Since the beginning of the microcomputer revolution, the dream of information retrieval has become a reality. It would have been difficult to guess 50 years ago that pictures and words could be sent and viewed instantaneously at a remote site at the whim of the user. Yet this is what the Internet provides. It is not a technology for selected individuals or professions, but for everybody, all occupations and all age groups. The importance of the Internet and World Wide Web cannot be overemphasized because of the innumerable ways that it can be used for educational purposes. One very important way that this technology is serving the scientific community is through research and communication (Brody, 1996). Library resources from universities across the country and the world can be accessed through the Web (Francis, 1997), a capability of great importance to instructors, researchers, and students everywhere. Today, information that can benefit students is available in virtually all fields of study, but only if they can use the technology well. Certainly, there are students who do not use it to its full capacity due to lack of knowledge of its capability or of how to use it.

The Problem

Although it is easy to assume that students who study engineering or other technological areas will adjust quickly to using the Internet and use it well, this assumption may not be true. Using electronic resources is a new way of accessing information and must be considered a change in education that demands a new approach to some aspects of students' learning. While the Internet can be helpful to students in terms of accessing information for research and assignments, there is a strong possibility of plagiarism (Auer & Krupar,

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2001; Scanlon & Newman, 2002). For example, students who know in advance that they will find a suitable paper to download, or those who panic because they have waited too long before starting an assignment may take the easy way by downloading papers from the Web (Renard, 2000). Similarly, there are businesses that sell compositions written by successful applicants, claiming that selling successful papers merely helps disadvantaged students and does not encourage plagiarism (McCollum, 1997). Instructors and admissions counselors are worried about students' sharing term papers or copying papers posted on the Web (McCollum, 1996, 1997). If an assignment is to achieve its purpose and proper learning is to take place, such activities should be of real concern to instructors.

Purpose and Research Questions

The last five years have seen widespread use of the Internet in educational institutions as a means to strengthen research and learning. Because information and documents are reproduced and circulated electronically, students can access information for research and assignments without using print material. However, if students are to use non-print materials effectively, they must be able to search for information successfully and also be able to document or annotate their sources. The purpose of this study was to gain information from students as to how they use the Internet, whether they understand and document electronic information, and whether or not their instructors question Internet information that is not documented.

To achieve the purpose of this study, the following questions will be answered:

1. Are technology education students aware of the importance of the Internet?
2. Do technology education students use the Internet for educational purposes?
3. Do technology education students properly document information obtained from the Internet?
4. Do technology education instructors question work that is not properly documented by students?

Method

This study uses a descriptive research approach to obtain information concerning students' use and documentation of electronic information. The design for the study was the One-Short Case Study, because a single group of student conference-attendees was studied once, subsequent to their use of the Internet (Campbell & Stanley, 1963).

A survey instrument was developed specifically for this study. Some items on the survey were taken from two instruments: the use of computers for workforce development (Ndahi & Gupta, 2000) and meeting the digital literacy needs of a growing workforce (Gupta & Ndahi, 2002). Questions were modified to suit the purpose of this study. A 4-point Likert-type scale was used for

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determining the level of agreement or disagreement with statements, with 1 = Strongly Agree, 2 = Agree, 3 = Disagree, and 4 = Strongly Disagree. Additional open-ended questions elicited further opinions.

The instrument was evaluated for face and content validity by a panel of experts made up of four instructors who teach computer courses and are experienced in research. The panel reviewed the questions on the instrument to determine if they accurately sought information to answer the research questions. After the panel's review, the survey was pilot tested with a group of 10 students who answered all the questions and also identified any question or statement that was misleading. Overall, the instructions and questions were clear to the students.

The population for this study was selected from technology education students attending the 2002 Technology Education Collegiate Association's (TECA) Eastern Regional Conference in Virginia Beach, Virginia. The institutions represented at the conference were Central Connecticut University, Georgia Southern University, Clemson University, Fairmont State College, The College of New Jersey, Old Dominion University, Virginia Polytechnic Institute and State University, North Carolina A&T University, Virginia State University, Millersville University, and California University of Pennsylvania. Approximately 220 students attended the conference. The procedure for selecting subjects for the study was the purposive sampling method (Borg & Gall, 1989). Students were approached by volunteer students administering the surveys during the awards luncheon and asked if they would participate. Only students who agreed were given a survey to complete. A total of 156 surveys were distributed and 130 were collected, representing an 83.3% return. Two questionnaires were not complete and therefore not analyzed.

Data Analysis

The quantitative data were analyzed using frequencies and percentages. The data from the open-ended questions were sorted and assigned to categories relevant to the investigation (Stainback & Stainback, 1988): the importance of the Internet, utilization of the Internet, documentation of information, and instructor responsibilities. Frequencies and percentages were also used to further explain data from the open-ended questions.

Importance and Utilization of the Internet

Students responded to several questions related to the importance of the Internet and how they use it. Ninety-three percent of the students agreed or strongly agreed that the Internet is an important technological tool for finding information and for research, while 7% of the students disagreed or strongly disagreed with the statement. In responding to the statement about how they learned to use the Internet, a large majority of the students (91.4%) agreed or strongly agreed that they learned by "trial and error." The students were asked if they had learned the Internet in some of their classes. The majority (72.7%)

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disagreed or strongly disagreed. Table 1 reports the responses to these statements.

Table 1
Importance and Utilization of the Internet

	Agree/ Strongly Agree		Disagree/ Strongly Disagree	
Item	*n*	%	*n*	%
The Internet is an important tool for information and research	119	93.0	9	7.0
I learned to use the Internet by trial and error method	117	91.4	11	8.6
I was taught how to use the Internet to search for information in some of my classes	35	27.3	93	72.7

In response to the question as to how long they had been using the Internet, 21 (16.4%) of the students said for about 6 years, while all others had been using it between 2 and 5 years. Only 14 students (10.9%) had taken a course or had formal training in classes such as computer science, computer basics, computer literacy, and technical writing. The overwhelming number of students, 89.1% (n = 114), had not completed a course or any formal training on how to search for information.

When students were asked to list Web sites and search engines they used to get information for research or assignments, 32% (n = 41) said they use Yahoo, and 29% of the respondents (n = 37) said they use Google. Other search engines used by students were Lycos, Hotbot, Infoseek, Altavista, AOL, AskJeeves, MSN, and Netscape. No Web sites were listed as sources for information.

Students were asked to list courses for which they were able to search for information from the Internet to complete an assignment. The courses listed by most students (95.3%) were English, Psychology, Geography, History, Communications, Transportation, and Basic Concepts of Computers. Other subjects that were listed by not more than three students were Manufacturing, Energy and Power, Industrial Design, Graphic Communication, and Electronics.

Respondents were asked their opinion about the best way to learn to use the Internet to search for educational information. Forty-nine students believed that trial and error is still best. Others suggested that it is through assignments, taking a course in computer literacy, and using instructors' guides. Many students believed that a computer literacy course should be a general education requirement, as is the case in some institutions.

Although nearly all students (93%) recognized the importance of the Internet as a technological tool for research, only 17.2% said they used it for that

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purpose. Seventy percent indicated that they used the Internet mainly for electronic mail (e-mail), while 13.3% used the Internet for fun, games, accessing music, shopping, visiting "adult sites," and searching for employment opportunities. In the words of one student, "I use the internet for e-mail, price comparison, and music." Students were asked if it were easy for them to do most of their assignments because of the availability of information on the Internet. Seventy-eight students (60.9%) agreed or strongly agreed with this statement because similar information or assignments are available online.

Information Documentation

Students can obtain information instantly with the click of the mouse. However, some were not aware that they had to document this information. A large majority (78.9%) disagreed or strongly disagreed that they were aware that it was necessary. Eighty-five students (66.4%) agreed or strongly agreed that it was difficult to document information obtained from the Internet. Ninety-five students (74.2%) agreed or strongly agreed that the Internet information is for the public and therefore does not require documentation. A significant majority (79.7%) agreed or strongly agreed that only information that is copyrighted needs to be documented. Table 2 presents the responses to these statements.

Table 2
Information Documentation

	Agree/ Strongly Agree		Disagree/ Strongly Disagree	
Item	*n*	%	*n*	%
I am aware that it is necessary for me to document the sources of information obtained from the Internet	27	21.1	101	78.9
It is often difficult to document electronic information	85	66.4	43	33.6
Electronic information does not require documentation	95	74.2	33	25.8
Only copyrighted information should be documented	102	79.9	25	19.5

Instructor Responsibilities

The role of instructors in contributing to students' documenting their work is important. A majority of the students (64.8%) disagreed or strongly disagreed that their instructors taught them how to annotate or document information from the Internet. Likewise, a majority (69.5%) agreed or strongly agreed that their instructors were more interested in the completion of their assignment and less concerned about the sources of the information. Table 3 reports this data.

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Table 3
Instructor Responsibilities

	Agree/ Strongly Agree		Disagree/ Strongly Disagree	
Item	*n*	%	*n*	%
My instructors taught me how to document electronic information	45	35.2	83	64.8
My instructors are only interested in the completion of an assignment, and not the source of information	89	69.5	39	30.5

Results

The population for the study was delimited to the students who attended the Eastern Regional Technology Education Collegiate Association Conference in 2002. As such, the results should not be generalized to all technology teacher education students. However, the results of this study can serve as a reference point for studying a much larger population. They could also serve as a basis for looking at other issues relevant to this study.

The Importance of the Internet and Utilization

Almost all students concurred that the Internet is an important technological innovation. It is significant that all students used the Internet, though it was used for a variety of purposes. An overwhelming number of students had not had any formal training on how to use the Internet to search for information. They learned to use it by trial and error. The students were familiar with different search engines, but provided no evidence that they were familiar with specific Web sites that are relevant to their areas of study. Nonetheless, the Internet is helpful, according to more than half the respondents, when it comes to completing assignments. A majority of the students said it was easy for them to do their assignments because they could find similar ones on the Internet.

Information Documentation

It is important to know whether students are aware of the need to document electronic information just as they do information taken from print material to avoid plagiarism. More than three-quarters of the students indicated that they were not aware of this. While some believed that electronic information required documentation, others thought that applied only to copyrighted information. Two-thirds of the students indicated that it is difficult to document electronic information.

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Instructor Responsibilities

Instructors certainly have an obligation to teach their students how to document sources of electronic information and to question Internet information that they do not document. However, only about a third of the students indicated that they had been taught annotation procedures. Additionally, the majority of the respondents supported the statement that their instructors were not interested in the sources of their information, but only in the completion of the assignment.

Discussion

The Internet is among the most significant innovations of the Twentieth Century. The technology is used for personal, professional, and educational purposes. It enables e-mail communication, posting questions to instructors, receiving and delivering assignments, research, and participation in listservs (Perrin, 1997). As a user-friendly technology, it is a valuable teaching resource for instructors and learning resource for students.

It is evident from this study that the students acknowledge the usefulness of the Internet. However, their perspectives vary regarding how effectively they use it. Only 14 students had formal training in how to use the Internet to search for information. Most of the students learned to use the technology by themselves or were introduced to it by their friends. This might be one reason why the majority of the participants said they used it only for e-mail, and only a small proportion used it for research.

Regardless of how user-friendly the Internet is, students may use the technology more effectively only if they receive formal training (Scherer, 1997). This can be achieved in many ways. Some of the students suggested that pertinent courses should be required as a regular part of their plan of study. Some said they would prefer that their instructors teach them how to access information that is specifically relevant to the courses they teach. This, in fact, may be the only way in which students can become familiar with available resources.

There are numerous Web sites sponsored by organizations, associations, journals, and magazines that serve teachers and students of technology education. However, no student mentioned any of these sites. Instructors need to be aware of online and Internet resources available for their students (Flowers, 2001). If students are to use online resources effectively, instructors must take some responsibility for introducing them to their students. It is, therefore, not a surprise that students were not aware of these important Web sites.

As with their counterparts in other studies (see Renard, 2000), students in this study were clearly aware of how easily information can be cut and pasted from the Web into assignments or term papers. Yet the vast majority were not aware that the sources of the information they copied from the Web had to be documented to avoid plagiarism. The students somehow saw information taken from the Web to be different from information printed on paper in traditional books and periodicals. This shows total ignorance on the part of a significant number of students who participated in the study. Internet plagiarism apparently

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continues to be a concern for instructors, just as it has in the past (see McCollum, 1996). In addition to the issue of plagiarism is the fact that the educational and learning value of assignments that are completed simply through cut and paste operations is lost.

Should students take complete responsibility for their ignorance? Given these findings, it seems less than fair to hold them totally accountable for failing to properly cite references. Students are apparently not taught about the importance of citing information sources. Moreover, they perceive that instructors are not particularly concerned about where the information was obtained or whether it was cited properly. Instructors, therefore, may actually be contributing to the spread of plagiarism by oversight, and or low expectations (see Freedman, 1998). Perhaps it is not only the students who are struggling with electronic information technology, but the instructors as well.

The problem of documenting electronic information should be viewed as a significant opportunity for change in education (McDowell, 2002). Some may argue that this situation reveals the shortcomings of high school curricula and implies a need for revision of freshman-level college courses. Such blame-passing, though, is likely to be unproductive. Instead, instructors must restructure their assignments so that in situations where students use Web resources, they are required to document their sources of information (Carnevale, 1999; Drogemuller, 1997). Certainly the Internet has made a great impact on education, and as we educate our students for their computer-dominated future, instructors must address the growing opportunities for dishonest use of the technology (Reanard, 2000). Taking a second look at our curriculum may be one of many ways to solve the problem of electronic information documentation and plagiarism.

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