College Students’ Uses and Perceptions of World Wide Web in an Information-Seeking Environment

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Abstract

From the standpoint of learning and academic research, World Wide Web provides teachers and students with easily accessible pools of rich and abundant information. However, the extent of the new technology in affecting students’ learning and cognition is still unknown and worthy of exploring. This study tries to investigate how undergraduate and graduate students view their information acquisition and how they perceive the quality of the information in terms of the open resource model, where information from diverse sources is retrieved through the use of the Web.

A series of interviews with semi open-ended questions were conducted with twelve students who were selected as subjects from two universities. After the interviews, all data were analyzed in three stages: data reduction, data display, and conclusion drawing and verification. The results were presented in seven main themes and six issues. As the result of the investigation showed, it was clear that college students care more about completing their assignments quickly and easily than the quality of the source where they obtain their information on the Internet.

INTRODUCTION

Adequately supporting research and learning activities becomes a major mission for academic libraries. In recent years, academic libraries face pressures like diminished budgets, increased patron demands, and rising costs for book purchases and periodical subscriptions (Ke & Chang, 1999). The thriving growth of electronic publications is reshaping the nature of collections and the mode of delivering and accessing information in libraries. The traditional print resources nowadays face challenges from their electronic counterparts in faster and timely delivery of information as well as in improved access (Bandyopadhyay, Chu, 1999).

Among various resources for learning, staff and students throughout much of the world can retrieve seemingly endless volumes of information from all over the globe. In a short span of time, it appears that the rate of production of electronic materials has exceeded that of print-based publications (Dalgeish & Hall, 2000). Many research findings (Agosto, 2002) indicate that the quality of information on the Web falls far behind printed materials. In fact, most websites are designed for purposes other than education. Information might not be censored or checked for authenticity or validity.
As the Web becomes an increasingly important method of delivery in formal education, librarians, teachers, and parents must pay more attention on teaching young people how to become critical users.

This study tries to examine how university students perceive their information acquisition in terms of the open resource model where usage of the Web is close in concept to the library. Rationales for undertaking this research are: firstly, analysis of library user behavior in respect to Internet usage has been increasing rapidly since the arrival of digital libraries and the Internet. Information services aim to satisfy the needs of their users in a way that ensures precision and effectiveness. Many of these services use intelligent information retrieval and filtering techniques to personalize and customize their content to the users’ interests and preferences (Papatheodorou et al., 2003). Secondly, analysis of usage of such online systems can provide valuable information on user behavior, perception, and experience of electronic information in general (Ke, Kwakkaelaar, Tai, Chen, 2002). Thirdly, accessing the Web as well as visiting the library to obtain information for an assignment or project is still novel, and the potential long-term effects of its availability are still lacking (Dalgeish & Hall, 2000). Fourthly, changes are taking place in the Web itself in a variety of ways such as the amount of information, quality and methods being delivered. Under these kinds of circumstances, it is necessary to understand students’ attitudes towards electronic information resources in order to assist them in making the most appropriate use of all information resources. Finally, fostering information literacy is a primary goal of library and information science. There is a need to know the students’ ability to access, evaluate, and use of information from a variety of sources for problem solving, research, assignment and continued professional development (Bruce, 1995).

This research is based on a qualitative perspective to explore the understanding of students’ perceptions of the Web. Wilson (1996) cited that when considering students’ responses to their perception of individual need, affective or psychological factors are just as relevant as cognitive ones. Therefore, in order to discover new insights into students’ attitudes concerning the Web, the phenomenological approach was implemented. Main interests were on how university students select a topic for their assignment or project, their behaviors in the information-seeking process, the positive or negative factors which they expressed during the seeking process, the extent of their awareness of the information accessed, and the dominant set of attitudes that arouse out of all these experiences.

LITERATURE REVIEW

Two major information-seeking theories from education, library and information science form the basis for this study and provide part of the theoretical foundation. The benefits and concerns of the Web as an information environment will be reviewed in this section.

The Benefits of WWW as an Information Environment

Owston (1997) mentioned that the Web is causing educators, from preschool to graduate school, to rethink the nature of teaching, learning, and schooling. Students’ conceptions of information sources varied widely, however, the main idea of information resources has moved from traditional library to the Internet. The Web has become an important resource for education and research. Halttunen (2003) synthesized two reasons why Web-mediate information services and sources have made information retrieval a commonplace activity. First, the rise of the importance of information searching in curriculum and second, the availability of electronic information sources and search tools. He also declared that from the viewpoint of designing information retrieval (IR) learning environment and instruction, it is important to explore learners’ conceptions of the domain to be examined.
The use of the Web as an information-seeking channel has many benefits. Dalgeish & Hall (2000) provided two attributes of the Web as compared to textbooks. Firstly, the Web has the ability to provide up-to-the-minute information and, secondly, this information can be obtained from around the world. Okerson (1999) pointed that there were weaknesses to the print system of publication. Print journals are slow to appear oftentimes and come to libraries through a distribution system full of pitfalls, not least those contributed by the world’s postal systems. Access to individual copy of the print journal is limited to one person at a time and further reproduction is legally questionable or expensive if done with the publisher’s permission and at all events labor-intensive. Searching print text with reliability is difficult, though browsing or reading print text is relatively easy. Access to collections is limited by location and availability, and that access can be slow and inconvenient.

From the cognition standpoint, the links provided on one Web page to connect to information on other pages are like a spider web expanding to no ends. This is in contrast to printed materials where information is confined within the covers. The linearity of the book and its mainly textual nature is in sharp contrast to the hypertext format of the Web and its frequent use of colors, graphics, and sometimes animations. Multimedia may appeal to young people who are brought up on a range of electronic entertainment mediums (Dalgeish & Hall, 2000).

Brunning & Konomos (1999) found that ASU system and Web services generate useful usage data such as 1) the usage of online system is high and continues to grow; 2) cost per search is decreasing; 3) usage of indexing/abstracting services online and Web products matches usage of the online catalog; 4) remote usage-increasing steadily; 5) where full text is available, usage increases; 6) electronic journals is lower than anticipated.

The range of Web usage is wide. People use the Web as an information resource to support their daily work activities and to engage in a range of complementary modes of information seeking, varying from undirected viewing that does not pursue a specific information need, to formal searching that retrieves focused information for action or decision making (Choo, Deltor, and Turnbull, 2000). From the view of students, the Web affects how, when, and where students learn about the world. It is accessible twenty-four hours a day, seven days a week. Students can access information anywhere, anytime, in or out of the classroom. Websites are continuously updated and revised. Dynamic by its very nature, the Internet allows students to find, almost daily, new sources of information on their topics. This nurtures students’ imagination, creativity, and willingness to explore. Furthermore, students can develop computer and information literacy skills during the information-seeking experience. Today, our society is computer driven, and information literacy skills build more productive citizens.

The Concerns of WWW as an Information Environment

Whilst the Web presents new opportunities for students to gain well-presented, global, up-to-date information, there are also problems that need to be taken into account, such as the extent of learning that is occurring and especially the development of critical thinking and analytical skills. For example, the risk of plagiarism is becoming more prevalent as a result of the ease of using “copy and paste” word processing function to directly take material from information sources and place it within assignment and the study habits of many students may change into scanning and surfing. Writing skills may become replacing synonyms into existing sentences or paragraphs. These we conclude as “shallow learning”. It is still questionable whether the convenience of the Web makes students procrastinate their assignments or the variety of information and games distract them from beginning their assignments. Their way of completing assignment hastily by extracting data from the Web could distract them from deeply studying the details in their textbooks or journal papers.
The effectiveness of Web search is also of concern. The Internet is a vast ocean of information; by its nature, the Internet lacks any sort of bibliographic control. Searching for a particular Web page without the use of proper tools can be tedious and even useless. The major problem with search engines is that search queries turn up far too many results, erring on the side of recall rather than precision (Eliopoulos & Gotlieb, 2003). It is of concern that most students have only a vague understanding of the way search engines work, which resulted in a poor exploitation of their facilities.

Techno-stressed is another problem when the frustration, confusion and fear caused by technology overload and the lack of sufficient direction to navigate the glut of information available become overwhelming. With the increasing amount of resources online, the ability to find data efficiently and effectively is essential (Reynolds & Smith, 1999). Information retrieval, especially subject retrieval, is clearly a difficult issue with which library profession as a whole has been struggling for many years (Hildreth, 1997). Users usually do not understand the complexities of bibliographic structures and inconsistencies in cataloging practices cause confusion for users. Moreover, studies consistently indicate that the information users bring to catalog searches is often incomplete, and that users are normally more successful in conducting known item searches than subject searches. It is found that subject-search users are more likely to assign a low score to catalog organization and encounter difficulty navigating the catalog than users of known item and other search methods (Halcoussis, et al, 2002). As Saracevic and Dalbello (2001) stated, education for digital libraries is a complex proposition, in part because it involves so many layers of technology and at the same time so much that is new in creation, content, representation, organization, access and use, and in social, legal, and cultural issues.

The quality of information has been a long-standing concern, though the Web has become an important source of information only in a short period of the time. With the Internet, anything can be published on the Web at low cost, and distribution is virtually worldwide. Profuse amounts of information are put on the Internet every day. In many cases there is no editor, reviewer, or any other kind of review mechanism to determine the credibility, quality, accuracy, or timeliness of the material (Branch, Kim, & Koenecke, 2000). What is more is that students do not realize that Web pages generally do not adhere to any criteria before they can be posted on the Internet (Beyea, 2000).

Information literacy enables a college student to recognize information needed, develop a strategy to locate, evaluate, and synthesize information, and cite sources of information accurately. Individuals are faced with diverse and abundant information choices in their studies, in the workplace, and in their lives. A variety of information is available through community resources, special interest organizations, manufacturers and service providers, media, libraries, and the Internet. However, information has increasingly come unfiltered. This raises questions about authenticity, validity, and reliability. In addition, online information is available through multiple media, including graphical, aural, and textual. These pose special challenges in evaluating, understanding and using information in an ethical and legal manner. The uncertain quality and expanding quantity of information also pose large challenges for society. Sheer abundance of information and technology will not in itself create more informed citizens without a complementary understanding and capacity to use information effectively (Bruce, 1997). Since study on students’ experiences and perceptions of information-seeking strategies can help understand the knowledge and implications behind education and information developing society, it will also help us to find ways to improve network information services and the design of the information retrieval system.
METHODS AND DATA ANALYSIS

Within the area of education, Cohn and Manion (1994) reviewed the nature of inquiry and discussed the phenomenological approach which they described as “the study of direct experience taken at face value; and one which sees behavior as determined by the phenomena of experience rather than by external, objective and physically described reality.” Denzin and Lincoln (1994) mentioned that “the word qualitative implied an emphasis on processes and meanings that are not rigorously examined or measured, in terms of quantity, amount, intensity or frequency.” These reflect the many understandings researchers have on the experiences of students in using the Web and the emotions that these experiences impact their continuing usage. Thus, this paper uses the qualitative method.

A series of one-on-one interviews was conducted by the author with the students. The students were selected from two universities and were pre-selected by a variety of means. The principal method of recruitment was through an informal interview with students in either computer lab or library. Students who were selected to proceed to the formal interview satisfied the following criteria: third year or above undergraduate or graduate students; an approximately equal ratio of males to females; coming from different academic background; and finally, had experience using the Web for academic purposes. The rationales behind the selection criteria are as follows: to get a better understanding of university students’ experiences; requiring that students should have completed some significant coursework; avoiding bias due to gender; and avoiding bias of students predominately coming from either a science or an liberal arts background.

Students were invited to the author’s office or the discussion room in the library to conduct the interviews. All interviews were tape-recorded with the permission of the students. These tapes were then transcribed to a computer file. Fifteen semi-structured open-ended questions were asked, including: the time and place they most often use the Web; the priority of information-seeking strategies after they received an assignment or project; the perceptions of information quality in traditional or online documents; their attitudes toward the future of the Web; and the issues they found while using the Web, etc. There was no fixed time limit for the interviews in order to allow full discussions of all matters that students felt worthwhile. They varied in length from approximately half an hour to one hour depending on the extent of the students’ experience of the Web and their willingness to talk. A guarantee of confidentiality was given to students so they could be at ease in discussing their views honestly and openly. The subjects were coded by a set of characters and number, i.e. G for graduate, U for undergraduate; F for female, M for male; and the serial number. For example, a graduate, male, number 4 student were identified as G/M/04.

Once the interviews had been transcribed, data analysis was based on the work of Huberman and Miles (1994), who considered this stage to comprise three linked sub-processes: data reduction and data display followed by conclusion drawing and verification. In this study, the author first repeatedly read the raw data and looked for thematic connections. Then significant statements were identified and grouped within appropriate categories. Responses from different students were compared and contrasted and finally, themes that were frequently occurring across a number of interviews were observed. These themes represent commonly held views and may be valid in the particular experience of one individual. Seven main themes were developed by the researcher and six issues relating to the Web were drawn from the interview data.

RESULTS

The study findings were separated into two main categories: seven main themes and six issues.
Main Themes

Interview data analysis revealed the following seven main themes:

The Use of Computers and the Internet by University Students

The time university students spend on the Internet per week is getting longer. Nine of the interviewees claimed that they use computers more than fourteen hours per week. They use computers and the Internet for many purposes, including education, entertainment, communication, etc. Thus, the time they spend in front of the computer becomes longer as they progress in their study at the university.

From the students’ point of view, Internet resources can be categorized into everyday information and academic information. From the academic standpoint, students are used to seeking information from the Internet for their assignments or projects. However, using the Internet has become a part of some students’ everyday lives.

I use the computer everyday because so many things interest me, and I am easily attracted by what each link links me to. Sometimes, I forget the length of time I spend on it.” (U/F/11)

Students can access the Internet from many places, such as in the computer labs, library, dormitory, video game store and even at home, but they use computers most in the dormitory or at home. Also, instructors are becoming more and more keen towards asking students to search for data or document on the Web.

When I was a freshman, our instructors often asked us to go to the library to do research. But know that I am a graduate student, many of the professors give us Web addresses for the extensive readings, or ask us to find more information on the Internet.” (G/F/01)

The worst experiences in using the Internet are slow transmission, inability to open a file, and computer viruses that crash the computer.

Sometimes I try to find the articles that I have read the day before, but only to find that the site has been closed. Failure to open a message often frustrates me, especially when I have to wait a few minutes.” (G/M/04)

At least eight interviewees expressed that waiting for file downloading is annoying, especially when there are too many popped up windows.

Sometimes, there are too many popped up windows. They are like flies around your computer. They are hard to close, because they are designed to open automatically, especially porno sites.” (U/F/03)

Responses to Information-Seeking Context

In the context of information seeking, students can be characterized as being under time-pressured situation and they always tried to obtain information quickly and easily. The same point has been found in Dalgleish and Hall’s (2000) article. The attitudes towards the Web were very much influenced by the way it impinged on their time. Receiving information is crucial in the process of seeking and forming their images of the Web.

I like the feelings that when you need something you can get it immediately. The Web often let you obtain information at your fingertips.” (U/F/11)

The speed of transmission on the Internet is important to me, because if I need to wait for a long time for a file to download, I’d lose my patience.” (U/M/10)

Speed of the Internet is essential for most of university students. However, there is also the concern that the content on the sites might not be relevant and appropriate for their assignments. They hate to wait for a long time for documents to download—especially those that students speculate might, or might not be relevant.

The description under each search result often differs from the content in the websites, this distracts me from my work and time is
wasted on those irrelevant documents.” (U/M/05)

The rate between the time students spent searching and the useful information they can find is a major concern. The average rate of finding information recognized useful or relevant is about 20% to 30%. Most of interviewees perceived that information on the Web is quick to find and easy to use, but they always complain of the low rate of retrieving relevant information on the Internet. Many students looking for assignment-related information tended to reflect on time wasted on pursuing irrelevant links.

“I think it is very convenient to find information on the Web. We can find a lot of information very quickly and easily.” (U/M/09)

“I must confess that I am a lazy boy, between the library and the Internet, I select the Internet first, because I have a computer in my dorm room.” (G/M/07)

“The Web is the first thing that comes to mind. It is common sense that seeking information on the Web is quick and convenience as long as you have your computer on.” (U/M/10)

They perceive that the information on the Web is convenient, and easily available and accessible, while the information in the paper-based texts in the library is more correct and reliable. As one interviewee said, “The most impressive thing about the Web is that information is at your fingertips.” (U/M/12)

“For celebrities or people in the spotlight or for special events, I’ll go straight to the Internet and I know I can find a lot of information about them. However, this kind of information may take more than one month or a year to appear in text-based documents.” (U/F/11)

Despite the attempts by librarians to promote the Web as an information resource and to provide a gateway to information sources via library Web page, most students have a clear distinction between the Web and the library as separate information seeking resources. Information found from different resources has different advantages. Information that comes from the Web is fresh and allows students to explore questions further while information provided in bind volumes allows students to expand their reading.

“How time is spent is different. With books or journals at the library, it is making photocopies, but with the computer it is
connecting and finding what you want.” (U/M/09)

Books are bind and the content is comprehensive within a volume. Information on the Internet is often scattered over many sites. The logical sequences of concepts in books are quite clear; the information found on the Web is up-to-date but need more time to organize...You can never eliminate libraries because most of the books found in the library have been previewed by authority process, and people can easily read them without having to worry too much about their accuracy and credibility.” (U/M/05)

Reading on the computer screen is another issue students are concerned about. Though computer multimedia presents information in a variety of ways and makes it easy to read, however, most of the interviewees still expressed that reading on the computer screen is not as easy as reading books.

I think they have different orientation. The library may provide us a comfortable place and a rich source of books, but the Web is easy to search and filter. Both electronic and paper-based documents are now available and they can complement each other. I would use them both. I think we need the Internet to back up books and books to back up the Internet.” (G/M/04)

**The Process of Information-Seeking Strategies in WWW**

Search engines are the most important gateway to students’ information-seeking and the description under each search result is the key for them to select to link. For academic purposes, students prefer Google over Yahoo to look for the information for their homework.

The approach most students use appeared to be an opportunistic one in which they type in a single word into a familiar search engine that they previously had had successful experiences with. The main search method they implement is using one or two keywords in the gateway software. They rarely memorize the URL for extended search.

I basically use keywords to find what I want, especially typing just a single word into a familiar search engine, such as Yahoo or Google, to find the information. But I think Yahoo contains more everyday information and Google contains more academic information.” (U/M/02)

For homework, I like to use Google, because I can find a lot of pages that relate to my academic topics.” (G/M/07)

I rarely type in the URL. I like to type in just a word to find more than what I have reviewed before.” (U/M/02)

Sometimes they find that it is not useful to use more than one keyword with logic symbols to find information. Sometimes, they find that their mental models deviate from the results given by the search engine.

“The words ‘and’ ‘or’ etc., or logical Boolean, between keywords does not have too many functions. I rarely use them in my search.” (G/F/01)

Some interviewees used their own special seeking strategies, such as using a similar keyword to find various links, then expand from one of the articles; search by a special person’s name, then try to find the information about him/her; search by the institute that is related to the topic.

When faced with obscure or unfamiliar concept, I type in a word that I think is closest in idea. I might try twice or more. If there is one useful article, I will link to it then go from there to other articles or websites, like a spiral.” (G/M/07)

In unclear situation, the interviewees claimed that a big gap between their mental models of the concepts and the results of a search engine exists. Some of them suggested that websites should be designed in different levels. Some sites should be designed for those who wish to know the basic or how or what the topic is, while others should be
designed for those who want to know more and find more details. The search keywords should also be separated into different levels.

Retrieving or Extracting Information from WWW

The descriptions under each search result often provide clues as to the content to each link. However, the percentage of useful information found from the Web is low. Interviewees estimated about 20% to 30% of the information found is useful for their uses.

- I think it depends on the degree of your familiarity to a certain concept. If you know that topic well, then you can type in accurate keywords and find a lot of information. If you have no clear idea of a topic, then you would end up trying over and over again and find little useful information. From my experience, around 20% to 30% are useful.” (G/M/04)
- Usually only one or two out of every ten search results are useful for my homework.” (U/F/08)

Though many students expressed that they like to read articles in books more than reading the articles on the computer screen, they become accustomed to reading on the computer screen when an article is useful, but they are still reluctant to read long articles or research papers on the computer screen. The best solution is to print them out.

- The constant flashes make my eyes uncomfortable. So I like to browse the Web for information, if there is a need for careful reading, I get a printout of it.” (G/M/04)
- If I have to read everything in detail, I would like to go to the library to find books, especially for those very large numerical data.” (G/F/01)

Multimedia is appreciated only when sounds and videos do not interfere with the speed of network. For information that is useful, most students expressed that whether to print an article or not depends on the length and importance of the article. The longer the article is, the more likely they would print it out. At the same time, the more important an article is, the more likely it would be printed out.

- I think most of the information on the Web is designed for people to link into and browse, so I usually get on the Internet and link intermittently to some sites. I like the different fonts or styles of the characters. Sometimes, the graphics and background music are soothing and enjoyable too.” (U/F/03)
- I want to save paper and conserve our trees, but the concept of electronic books may not really save paper, because it is difficult to read on the screen, especially for those long articles. People may print it out again and again.” (U/M/02)

Before citing the content into their research project or assignment, they usually read carefully and extract the most relevant parts. Some students mentioned that they might copy the whole article first, then delete some parts and copy or fill in some parts from other articles into the original framework.

- When I find a useful article on the Web, I read it carefully first. Then I’d paste some paragraphs to a new Word document. Then I’d try some other websites and paste some more. Then in the end I’d reorganize my article for the assignment. Sometimes, there is no real reorganization except changing the structure and order of the sentences.” (G/M/07)
- Some professors have the habit of finding information on the Internet, so he/she may discover the plagiarism very easily. When I was a sophomore, some of my classmates were caught for their copying without using citations.” (U/M/10)

Some students are concerned with the copyrights of Web information. The interviewees recognized that most university students in Taiwan possess weak concepts of using others’ information. They may know that it is illegal to use pirated software, but they don’t necessary
know that references must be cited when using other people’s articles.

Perceptions of Information Quality in WWW

Information quality is of most concern to educators, however, information quality is not a concept that is explicitly articulated by students. Students generally perceived that Internet information is up-to-date and contrasted this with library printed holdings. But they primarily think of printed materials found in the library have more authority than information found on the Internet.

Relevancy and usefulness are very closely related concepts for students in assessing information quality. Whether the search is satisfactory or not depends mostly on the degree of relevancy to what they are trying to write about.

If you find an article that is very well written but does not relate to your homework…I don’t care who wrote the article, but I definitely care about the relevancy of the information for my project.” (U/M/02)

First you have to see if it is useful or is about the problem you are trying to find. Then you have to see if it has lots of stuff you can use. I’d select those sites with more information that I can use.” (U/M/03)

Some students are alarmed by the low credibility and authority of the information on the Internet. They try to differentiate personal websites from academic or institutional websites.

Anyone can post anything up on the Internet, especially on personal websites. These websites are always neither reliable nor accurate at all.” (U/F/08)

I think it is necessary to have some mechanism to censor the quality of websites, either by the government or by academic institutes.” (U/F/11)

Some interviewees said that it is difficult to judge the quality of information on the Web. They also expressed the need for training university students to use Web information, especially in identifying embedded biases, special purposes, or commercial ends, etc.

Attitudes Towards the Future of WWW in Education

Interviewees recognized that the Internet will become an integral part of university life and will bring changes to teaching and learning methods in the future. Most students are aware of the potential educational impact of the Web, however, traditional methods are still preferred by almost all students as the basis for teaching and learning.

I think it is a trend to take some courses online. Multimedia makes sync and async programs possible. In the future more and more courses can be found on the Internet.” (U/M/09)

You can take classes in your house, you can even discuss or talk online, but I like to talk with my classmates in person. The relationships among classmates or roommates are unforgettable. I think having personal contact in class is quite important.” (U/F/11)

Most students do not think that the new channel will replace books. No students conceived a time when traditional books would not be available. Some students also find that some information that is available today may not be available tomorrow.

I don’t think books will be replaced by the Internet. Even though computers do have a very significant place in educational settings, I still think it will never take the place of books. Books are still preferable and important.” (U/M/09)

I can’t agree that books will be not available. Many authors still like to write a complete copy of their studies or their stories. Books can be easily read, you can lie on the bed and read, and you can turn back and forth to compare or check your reading. It is so comfortable reading books, it is not so on the Internet.” (U/M/05)
Web-based instruction will be popular in educational setting, especially in post formal education.

After life on campus, I think I will continue to use the Internet to find information instead of asking the professors. So I think Web-based instruction will be very useful for all people in their life to learn or know new stuff.” (U/M/09)

There is a phenomenon that needs to be addressed. Alienation from reality becomes obvious among students who spend long period of time in front of the computer. The reality or virtuosity of information sometimes confuses them. While Web-based learning becomes an important method of learning, it is also important to prompt learners’ ability to find and select correct information.

Issues

There were six issues that arose from the Web and discussed in the interviews.

First, plagiarism is easily committed, especially under the easy “copy/paste” function in computer word processing. The debate between citation and plagiarism has existed for a long time. The degree of quality and quantity cited from one document is not easy to define. Before the Internet, university students need to retype or rewrite every character from other’s article. Nowadays, extracting a paragraph or an entire article takes only a click of the mouse. The simplicity and hassle free of citation and using framework to rewrite may affect many students’ in depth thinking and creation.

Second, pornography on the Web is another issue that alarms educators. Some students expressed that many porn sites are embedded in some keywords that one may not realize, but automatically prompt another window to open. This kind of information may not be harmful to most university students, but those with weaker wills might end up indulging in these sites. This phenomenon might explain why porn sites are always ranked as one of the top ten sites around the world. Form the view of an educator, what we can do and how to prevent adolescence from viewing and lingering in inappropriate materials are still a serious issue we have to face.

Third, a standard reference style for retrieved information from the Web should be constructed. The APA electronic reference style does not provide a concrete format to cite information from the Web, since the nature of information on the Internet is so broad and multifaceted. The other problem is that files on the Internet are usually updated frequently or become nonexistent.

Fourth, the author of the Web pages or the articles needs to be identified. Many websites are constructed by a team or by an institution and the designer may be replaced, therefore it is difficult to identify the author of an article. Another serious problem is that the information of many websites might be second source or even third source information. The need for authors of original documents to put their name on the article is critical.

Fifth, the need to establish some sort of evaluation to promote information quality on the Web is a concern to many. Many educators point out the problem and the difficulty to help students to learn how to evaluate the quality of the information. There is a pressing need to establish a set of steps and criteria that can help students to evaluate the quality of Internet information.

Sixth, the Internet affects social interaction. More students are becoming computer children; they play computer games, talk in the network chat room, send messages through electronic mails, and use the computer for everything. When they are in a social setting, they might feel awkward talking to people. They feel strange when they have to borrow a pen or a book from others. It is no doubt that this phenomenon is now affecting human interactions.
CONCLUSIONS AND DISCUSSIONS

The main contributions of the present study are twofold. First, the main overall picture of college students’ uses and perceptions were grasped. The qualitative approach has found that their experience on the learning and information-seeking habits is important for the development of online learning. Second, methods and issues to the learners’ conceptions of the library and information have been discussed. Studying different ways of understanding the phenomena being studied and investigated forms the basis for successful design of the learning and research environments.

Seven main themes and six issues can be concluded from this study. The seven themes include: 1) campus students spend longer time on computers and the Internet per week; 2) in terms of information-seeking, since students are usually under time restraint, quick and easily accessible information becomes an issue of concern; 3) most students believed that the information on the Web is more abundant and up-to-date than information obtained in the library, and most would do their search on the Web first because it is quicker and more convenient; 4) performing keywords search in search engines is the most common method for students in information-seeking, and the descriptions that come up in each search become the key factor for them to select the link; 5) many interviewees expressed that the applicability of the information found from the Web is relatively low; 6) students believed that the relevancy of the information and its applicability are important; 7) students believed that the Web will bring changes to teaching and learning methods in the future, but will not replace traditional methods.

Six issues were also induced from this study. First, the issue of plagiarism needs to be addressed, especially when the “copy and paste” function is so readily available in computer word processing. Second, the issue of pornography on the Web is a long-standing alarming problem that needs to be addressed. Third, a standardized reference style for Web retrieved information needs to be constructed. Fourth, the identity of the author for the Web pages needs to be revealed and how the information obtained from the Web can be used in classroom assignments needs to be addressed. Fifth, evaluation of the accuracy and quality of the information obtained from the Web is needed. Sixth, whether the time spent online has any affect on classroom learning and social interaction needs to be studied.

After the investigation, there are still many points that need to be stated to confirm the strategic priorities of education policymakers, funding bodies and library and information professionals. Firstly, the uses and perceptions of college students suggest the need to help students develop the concept of interoperability of information resources since both traditional and nontraditional methodologies are equally viewed as important resources for academic purposes. Secondly, the weakness of college students’ perceptions of information quality implies the need to develop students’ information literacy. It was clear that college students care more about completing their assignments quickly and easily than the quality of the source where they obtain their information on the Internet. Since plagiarism is still easily committed and shallow learning becomes common, the development of students’ information literacy in the Web environment is as urgent as ever. Thirdly, the potential of Web-based courses has been perceived, the development of high quality online learning sites still requires more study and research in the area of multimedia courseware. Finally, user behaviors need to be investigated deeper in terms of their perception and longer in terms of long-term observation. Since efficient and effective access to online information becomes increasingly critical as amount of services for delivering the Internet is continuously increasing, analyzing the behavior of users of digital library and Internet can provide useful information to educators, library administrators, and higher education policymakers. Our goal is to help users take the best advantages as much as possible.
REFERENCES


