A VISIT TO THE INFORMATION MALL: PERSPECTIVES ON STUDENTS' NAVIGATION OF THE WORLD WIDE WEB

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Abstract: This study concentrates on the general web-based information seeking behaviour of secondary school students and their use of websites, in particular, finding if Secondary Three students use Web resources for their information needs in conducting school projects and assignments. The survey aimed to discover the level of Internet searching ability and problems encountered. It was an effort of an initial fact-finding process to investigate students' readiness and reception to usage of digital libraries. As confident and savvy Internet users, the sample surveyed value access to accurate, up-to-date information accessed in the shortest time possible. They are aware of the shortcomings of information available from the Web and of their needs for assistance in conceptualizing search terms.

Keywords: Online information seeking behaviour, Web searching; Internet usage, Students' information needs, Information literacy, ICT skills

INTRODUCTION

Malaysian's ICT infrastructure and supportive governance are already in place and the nation is appreciative of utilizing ICT. Recent surveys of various population pockets have indicated high computer ownership [12; 13], but low Internet use. Various reasons were given by respondents, which include insufficient skills and not connected to the Internet. Among the younger population, Internet use may be higher. A study of 608 students in secondary schools in Kuala Lumpur indicated that 313 (51.5%) used the Internet either at home, at friends' houses, at cyber café or at schools [16]. Schools connectivity and ICT penetration is growing and at the end of 2003, 40% of the Malaysian population are Internet users [14].

The Internet connectivity at schools in recent years has opened up an interesting multimedia cyberspace for students. INFOSOC Malaysia [10] reported that 30.5% of primary and 53.8% of secondary schools have PC facilities and among these, 10.2% of primary and 34.0% of secondary schools have Internet access [9]. The World Wide Web has become part of the school life for urban school children and teachers. Information seeking behaviour via the World Wide Web therefore has become an essential skill for students' learning, and at the same time it brings about new challenges for the students.

The challenge requires that students possess and demonstrate literacy skills, namely, to access information efficiently and effectively, to evaluate information critically and competently, and to use information accurately and creatively. [1] Indeed the Internet is a fun place for many to browse around and enjoy rich sensory experiences provided there. However can children search the World Wide Web proficiently to locate relevant information? Studies on information seeking behaviours in the past 15 year indicates that children and youth experience substantial difficulties. Common problems occur in spelling and keyboarding, generating search terms, grasping keyword concept, planning search strategies and evaluating search results, and children are often confused with the workings of Boolean logic [2; 5; 8; 15]. Fidel et al's [7] study of the Web searching behaviour of high school students is a good place to start looking at how students use the Web. They preferred using the Web to print sources, but in most cases, they were unable to locate precise information for their needs. Their search behaviours on the Web generally consist of excessive browsing, hypertext linking and looped search. They rapidly move from websites to websites, spending little time and evaluating or contemplating search results. Fidel [7] also found that many of them look quickly at the first page of a website and rely on text and graphic cues provided there to determine the quality and relevance of a website. Nevertheless, they were satisfied with their own search performance and results, and believed that they knew all about Web searching, thus felt that there was no need for them to learn more efficient ways of searching. Another study conducted into use of Web resources is by Cmor and Lippold [3] who put

forward a number of observations from their experiences of student searching behaviour on the web. These findings can be summarised as: a) students use the web for everything; b) they will spend hours searching or just a few minutes; c) searching skills vary and students will often assess themselves as being more skilled than they actually are and, d) they will give discussion list comments the same academic weight as peer reviewed journal articles.

This paper reports a preliminary study involving 100 students from 2 prestigious secondary schools in the Klang Valley, in an attempt to determine if they encounter the same search problems and demonstrate similar search behaviours. It was an effort of an initial fact-finding process to investigate students' readiness and reception to usage of digital libraries to find information for their school projects and assignments. The students in the survey are aware that the Web does not meet all their information needs. From their point of view as Internet users, the students identified several major barriers to their successful search and use of Web resources. The paper concludes with a discussion on the implications to a) address the problems in the instruction of information literacy skills so that students can fully utilize the power of online searching and become efficient information searchers, and b) build viable educational digital libraries which can meet the students' information needs.

MATERIALS AND METHOD

This study was the first in a series aimed to investigate students' readiness and reception to use digital libraries in finding information for their school projects and assignments, as well as to ascertain the basic features needed for the digital library. Students are the stakeholders of the system, and understanding existing stakeholder's conditions and environment that would ensure the reception of a digital library system is considered the most effective method of ascertaining the system's requirements. At the preliminary stage, the objectives of the study are a) ascertaining students' readiness to participate in the building of the digital library as content providers and developers. This would include finding out their ICT skills, their knowledge and use of the Internet; b) ascertaining the types of information that students require and would use when undertaking their projects. This would include studying their current behaviour of information use and their perceived level of satisfaction with the available information.

In adopting the case study approach, the aim is to "illuminate the general by looking at the particular." [4]. However, the study does not intend to over-generalise from what is an isolated investigation, rather to gain some insight from which some wider implications may be supposed. Questionnaires were distributed to 100 students who at the point of the study, had submitted their PMR History project report. Two schools were selected; the Klang Convent National Secondary School and the Victoria Institution. Subjects comprised Secondary Three Students with a more or less equal divisions of girls and boys. They were ethnically and culturally diversed. The schools were chosen because both provide Internet connections and the schools are situated near numerous cyber cafes, putting the stakeholders in an ICT rich environment. It is assumed that this community would have no problem accessing Internet resources. The survey received 74% responses and all returned questionnaires were found valid for analysis.

The first part of the questionnaire contains four questions, which provided the demographic information about the respondents. The second part comprises 14 questions (12 closed-ended and 2 open-ended questions) that aims to ascertain student's level of computer and Internet literacy, the methods used to gather information for school projects and the type of information sources used. The questionnaire asked a variety of questions about Internet use and particular Internet searching behaviour. Students were asked to self-assess their Internet searching skill level. They were also questioned on their knowledge and use of various types of online information sources. The open-ended questions asked about the problems they faced when searching and using information from the Web.

RESULTS AND DISCUSSION

The responses to the survey have established that the Internet seems extremely attractive to the students; most of the students sampled use the Internet for their studies. All respondents indicated having used computers before and 89.2% have a personal computer at home and Internet access from their home. Only 10.8% reported not owning a home computer and have never used the Internet before. The students mostly access the Internet from their homes (56.2%), while others use the Internet from their schools (20%), cyber cafes (14.3%), friend's houses (8.6%) and others (1%). The students sampled are also frequent users of the Internet with more than 50% logging on between once to twice a week and 30% more than twice a week. The responses showed that a very high proportion of the students (89.2%) reported using the Internet for their studies – either doing school projects or school-related assignments. Generally, the main uses of the Internet are to search for information (33.2%), read and write e-mails (29.6%), chat (19.6%), and computer games (12.6%).

The students who are Internet users were asked to self-assess their Internet searching skills by ranking themselves into one of three categories: beginner, intermediate and advanced. A total of 39.4% classed themselves as beginners, 28.8% as intermediates and 31.8% advanced. Therefore, more than 30% of the sample were relatively inexperienced and overall, about 2/3 were below the advanced level. Although some respondents self-rated themselves as having intermediate Internet searching skills, this may be loosely interpreted to mean that they had an average skill level. There was still a big proportion of the sample who had little or no experience (non-Internet users). However, because the rating was self-assessed, some care must be used in interpretation, as people have a tendency to under, or over, assess their own abilities.

Students were questioned about their Internet searching behaviour They predominantly use browsing over search strategies. They especially favoured the Back command, and use it almost exclusively. The next popular activity is clicking hypertext links. From their responses, it showed that all Internet users (66 students – better put %) have used a search engine in their searches. The most widely used search engines are Yahoo! Google and Cari.com. Their usage, however is quite limited to certain information sources (i.e. Websites only) and this is perhaps reflected in the low levels of success in their searches. The highly used search strategy is by subject (36.8%), followed by title (33.3%) and keyword (23.8%). This indicates that some students entered a complete phrase (as in subject) or whole sentence verbatim (as in title) as a search term. In other words, they used natural language as given to them in class to launch a search. However, students in the sample are versatile in their downloading skills of resources from the Web. The most popular resources used are photographs, charts as well as tables, audio and video files.

Although the Internet seems extremely attractive to the respondents, the library is still the most frequently used resource, which includes their school library, the state and national libraries (38.2%). Students also surf the Internet for information (30%). About 11% of the students indicate going to sites such as museums, national archive and relevant municipal council offices to obtain information. Other methods such as distributing questionnaires, interviewing persons, reading magazines, books and using information given by friends are also used. Although the library is still the most frequently used source when conducting school projects and assignments 97.3%, the Internet will be taking preference over school libraries as a place to do research and school work 78.4%. This could be attributed to the students' high PC ownership with Internet access.

Overall, the responses from the survey clearly illustrate this sample's a) high usage but lack of Internet searching experience and b) reliance on the Internet to fulfill their information needs, and this can be further supported by the extremely positive response rate of 93.2% indicating a need for a digital library with 97.3% confirming that they would use a digital library for educational use to search for information if one is available.

Perceived barriers

The study also found that students share several common problems in searching the Web, which included rapid navigation, overuse of the "Back" button and formulating search strategies. From their point of view as Internet users, the students identified several major barriers to their successful search

and use of Web resources. Regardless of whether or not these barriers are genuine, students perceive the following:

- Finding contradictory information in the Internet from text books and reference sources;
- Insufficient reference sources available;
- The quality of information they find is not good enough for their project and assignments;
- Getting too much irrelevant and inaccurate information;
- Getting too much information;
- The websites' address is too long resulting in difficulties in remembering them accurately
- Difficulties in finding good quality illustrations (image or photographs) for their school projects;
- Information not current
- Not knowing which reference sources to use or which Web sites give the needed information;
- Spending too much time searching on the Internet but not finding enough information;

The students are aware that the Web does not meet all their information needs. They value the accuracy of the information they find, however they believe the Web falls considerably short of delivering that accuracy, as the comments earlier show. Students want the information they find to be up-to-date, acceptable and adequate for school projects and assignments. They enjoy the speed and ease with which they could find information on the Web without having to prepare their search strategies. It is interesting to note that the students are able to decide whether a site was credible or comprehensive and current enough to meet their information needs.

Harnessing the information mall: Some implications

Searching the World Wide Web is like visiting a shopping mall [7] as there are innumerable types of information, in a large variety of containers and in many different locations, all available in one place. Web information seeking behaviour has become an essential skill for student learning, and at the same time it brings about new challenges for students. The challenge requires that students possess the necessary information literacy skills. In order to become information literate, students need to develop skills in three areas: specific web searching skills, the search process itself, and web reading strategy [1]. Solely using browsing in searching will take more steps and time to gain the needed information. Moreover, excessive browsing could easily get students sidetracked and opened up more possibilities for aimless exploration on the Net. Students, as Internet users, must have a clear understanding of what they set out to look for, that is to know their specific information need, including the breadth and depth of the information. They need to be taught how to plan search strategies, explore information sources, evaluate search results, synthesize information and finally present information. An information literacy model should be integrated into areas of the secondary school curriculum in all subjects. The need to integrate information-seeking skills into the curriculum is not new. However, the practice is lacking in the Malaysian education scenario. Teacher librarians can collaborate with subject teachers in information literacy instruction and use a search model to enhance teaching and learning. Many schools abroad have benefited from the integration of the famous Kuhltau's ISP Model [11] summarized in Table 1, Eisenberg's Big Six [6] (Table 2) and other models in their curriculum with great success.

From the survey, it is also apparent that there is a gap between students' expectations for Web resources and their perception about the information and service they receive. It is clear that students will continue to depend upon the World Wide Web for resources. However, from the students' perspective, the Internet offers scant, inaccurate, unreliable and out-of-date information needed for their school projects and assignments. There is a serious need to address the issue about the quality of Web content. Again this call for an information literacy instruction to teach students how to evaluate Web-based resources.

Table 1: Kuhlthau's "Information Search Process" (ISP) model to teach information-seeking skills.

Task Initiation	Student receives assignment; uncertainty is common
Topic Selection	First major decision point; students weigh alternative topics based on 4 criteria (personal interest, assignment requirements, information available & time allotted); optimism sets in after topic is selected
Prefocus Exploration	Most difficult stage; confusion sets in as students gather information which may be inconsistent and incompatible, and which may not fit in comfortably with their prior knowledge
Focus Formulation	Second & final major decision point; turning point of research; as focus gradually emerges, students feel confident; topic becomes personalized; this stage crucial to completing project successfully
Information Collection	This is the stage traditionally covered by bibliographic instruction; students gather information to support focused topic; interactions between user and information system most effective at this stage
Search Closure	Students cease researching, synthesize findings and begin writing; relief and satisfaction are typical at conclusion of research

Table 2: The Big Six Information Skills Model

Task Definition	Define the information problem Identify information needed in order to complete the task (to solve the information problem)
Information Seeking Strategies	Determine the range of possible sources (brainstorm) Evaluate the different possible sources to determine priorities (select the best sources)
Location & Access	Locate sources (intellectually and physically) Find information within sources
Use of Information	Engage the information in a source (read, hear, view, touch) Extract relevant information from a source
Synthesis	Organize information from multiple sources Present the information
Evaluation	Judge the product (effectiveness) Judge the information problem-solving process (efficiency

There is also a series of limitations related to the fact that contents available are not sufficient for the students' information needs and reflect experiences dealing with different settings and population groups. There is an urgent need to generate more local content in order to capitalize local experiences and increase local knowledge through collaborative efforts in the form of Web-based instructions and educational portals, as well as digital libraries. Judging by the familiarity and acceptance that students seem to have for digital information sources, the provision of digital libraries to this group of users is an exciting endeavour that seems filled with endless opportunities. They would have greatly benefited from an easy and immediate access to knowledge tools and repository in the digital libraries. More digital reference services should be optimized to meet the information needs of the secondary school students.

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