

Russian roulette or Pandora's box: Use of the Internet as a research tool

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Abstract:

The Internet has become an integral element of academic research and study. As information specialists are we really aware of how university students and academic staff perceive the information on the Internet and how they use it for research and study? This paper outlines the findings of an investigation undertaken at La Trobe University Library to gain critical information from users on their practice and success in locating relevant information from the Internet. Information gained was incorporated into the design of client-centred Internet training programs and modification of Library web pages.

Introduction

This paper reports on an enquiry undertaken during 2000 by Lorraine Chapman and Helen Ivankovic (Health Science librarians at La Trobe University Library) into the perceptions and use of the Internet for research or study by members of the La Trobe University academic community.

The title of this paper is derived from a statement by a postgraduate student, who was expressing frustration and distress at her lack of searching skills. She stated that finding required information on the Internet was for her pure chance 'like Russian Roulette'. Throughout the investigation, the researchers encountered many similar expressions of concern and frustration. For many users, the Internet is an endless source of information. The volume of popular level, commercial information has increased greatly through the 1990s. The quality of the information varies from academic, expert, authoritative and accurate to popular, inaccurate and even dangerous. Awareness of this is essential for academic users, as it will significantly impact on their selection of information.

Due to the characteristics of the Internet, it appears to be a student's dream. It allows convenient, timely access to large amounts of international information, some of which can be difficult or impossible to get in print. However, unlike a large amount of printed information there is no systematic editing or expert review of web-published material. It is therefore necessary for the academic user to be aware of this and to critically analyse retrieved information before applying it in any way, in particular for research or production of assessable tasks. To be able to do this presupposes an existing in-depth knowledge of the subject and an awareness of criteria on which the searcher could base an evaluation. It is unrealistic to expect undergraduate students to be equipped with both of these attributes without some instruction.

Usefulness of the Internet to students depends on their competency in coping with the technology and their ability to search effectively to select required, appropriate information.

Background

The investigation was motivated by coincidence of the following:

- shared concerns with professional colleagues that many students appeared not to have adequate skills to:
 - deal with technology and software problems
 - search effectively
 - filter the information retrieved for relevant material
 - critically evaluate the results for accuracy, currency and suitability for scholarly research

(These concerns were based on observation of student competencies in training sessions and anecdotal evidence from students themselves.)

- increasing expressions of alarm within the health profession, from health educators and health information experts at the expanding volume of inaccurate and misleading health and medical information available on the Internet and a fear of consumers' inability to recognise it.

- a growing trend within the University to deliver courses online and provide information resources via the Internet. There is an underlying expectation that students undertaking online and distance courses will use the Internet as a significant information resource. The researchers felt this delivery mode is based on a number of widely held, yet untested, assumptions about quality of information on the Internet, students' access to it, and their skill level to locate it. These assumptions have critical academic implications for students and will ultimately impact on their ability to successfully undertake online courses. The assumptions (defined in detail later in this paper) were identified, analysed, discussed and tested through the investigation process.
- the library was undertaking a review of the library homepages. To inform the review process, the library required information on how useful and effective library homepage sites were to patrons. The results of the investigation contributed to this process.

Methodology

A review of the literature revealed that a number of studies had been carried out into university students' use of Internet resources. These studies focused on evaluating student use of the library homepages or search engines. It appeared that, as D'Esposito and Gardner (1999) observed, much of the literature on the use of the Internet was 'librarian centered rather than patron centered'. Very little of the literature explored the experience of a range of academic users and in particular the opinions and attitudes of academic staff about the information their students presented for assessment.

Objectives of this research were:

- to carry out an investigation to identify experiences, attitudes and responses of Internet users
- to examine the way members of this University community utilised the Internet particularly for academic study or research.
- to assess competency in using the Internet as a research tool
- to gain an understanding of academic information-seeking behaviour when using electronic information resources
- to test some assumptions about use of the Internet
- to review responses to, and use of, library web pages
- to provide a basis on which to design client-based Internet training programs.

The investigation included as broad a sample of the university community as possible. This was achieved by surveying a cross-section of the academic population including all age groups, gender, undergraduates, postgraduates and academic staff involved in study and teaching in all faculty areas and based at regional and metropolitan campuses.

The process consisted of a broadly-applied survey tool followed some time later by a number of specifically targeted discussion sessions. The results of both of these were collated and cross-tabulations carried out. A report was presented to the Library, giving the major findings, the issues arising from the investigation and other implications.

The Survey

Participation in the survey was voluntary and responses were anonymous. Survey questionnaires were distributed at a range of locations on regional and metropolitan campuses. In addition to the print version, an electronic version of the survey was available on the library homepage for the one-week survey period. Some of the regional campus libraries provided a link to the electronic survey on the main campus library homepage. To achieve the most informative input possible the survey included a variety of methods of response. Some questions required the respondent to tick the box, some involved ranking questions and there were three open-ended questions.

The survey questions were grouped to provide information for three main aspects of the investigation:

- **to define an Internet user profile**

In order to develop an in-depth personal profile of the survey respondents, questions included identification of campus location, whether an undergraduate, postgraduate student or member of staff, the main area of study, gender and age.

- **to examine skills in using the Internet**

To establish an Internet skills profile of the respondents questions asked about the length of time using the Internet, what it was mainly used for and, where it was mainly accessed. Questions were included to determine skills and search methods used. Survey respondents were asked to self-evaluate their success in locating relevant, appropriate information. Survey questions attempted to identify problems or difficulties faced and outline types of strategies used to deal with them. To review respondents' usual study methods, the survey requested the ranking of importance of a select group of resources for specific assignments or research activities. It also enquired into any previous Internet training which had been undertaken and sought reactions to suggestions of further training.

- **to evaluate the library homepage**

A significant section of the survey sought users' opinions on the library homepage to determine which links from the homepage were used and with what level of success.

Discussion Sessions

Following the survey, three discussion sessions were held with academic staff and postgraduate students. Participation was voluntary. Invitations were extended to all academic staff and postgraduate students. These were distributed as flyers, sent via email lists and published on the library homepage under the "What's New" button.

The objective was to gather reactions, experiences and observations related to their own or their students' use of the Internet from those working at postgraduate level or above. An additional aim was to test some of the responses to the open-ended survey questions with this select group, in order to identify commonly-held concerns and shared experiences.

Analysis of the survey and discussion sessions

There were 236 useable survey responses. Data from the survey was collated using the SPSS software and data tables created. Cross-tabulations were carried out to cross-reference all responses by study level and faculty.

The purpose was to identify common responses from a particular study level or from those undertaking study in the same subject discipline. This data was subjected to further scrutiny to determine if any inferences could be made about study habits or information needs of the different groups. Responses to the three open-ended survey questions were analysed and collated separately.

The discussion sessions held with academic staff and postgraduates highlighted a range of issues including:

- the importance or value of the Internet as a resource for their subject area
- where the Internet fits into their research hierarchy
- skills and strategies used to locate required information
- if and what type of training had been undertaken
- assessment implications for their students.

Discussion encompassed the open-ended questions from the survey and examined the untested assumptions about the Internet. Individual contribution to the discussions often reflected the participants' level of experience and success in using the Internet and was usually based on how well it catered for their need to carry out specific tasks. Even those who were effective users and had positive experience with the Internet were aware of the negative aspects, having also experienced many technical and unique web problems.

Summary of Findings

Internet user profile

The survey results indicated that the Internet was mainly used for educational or study purposes. Most of the undergraduates and postgraduate students had been using the Internet for more than one year with the majority of academic staff having used it for more than three years. Most survey respondents accessed the Internet from a location on the university campus, either at library workstations, or university computer laboratory, or (in the case of staff) from their school or department office. Just over half of the undergraduate respondents, a third of postgraduates and 20% of staff had access to the Internet from home. This equated to only one-third of the total participants having access to the Internet from home. Our average user profile is that of a female undergraduate Health Sciences student aged between 17 and 24 and studying on campus at Bundoora.

Information-seeking behaviour

The Internet in the research process

Although it was agreed the Internet is now an integral part of the process, most academic staff and postgraduate participants indicated they would not usually use the Internet as the starting point for research, preferring instead to use the library catalogue and databases. For many of these participants, the usual pathway was to go first to the databases to identify articles and conference papers and then go to journals or electronic resources.

Undergraduates usually accessed the library catalogue first and then the Internet and other web-based resources on the library homepage including links to other library catalogues and the databases. One academic staff member observed that students go to the Internet first 'because it is easier for them. They don't have to show that they don't know how to do something, for example how to use the catalogue and databases.'

Skills in using the Internet

As part of the survey, respondents were asked to evaluate their ability to locate required information. Most assessed their ability as high or medium. This response was interesting as this rating did not match the experiences and comments related to searching skills, types of problems encountered and coping strategies employed that were recorded in a later survey question. Neither was it supported by the experiences of discussion session participants who were basic Internet searchers.

Searching Techniques

The majority of respondents carried out very basic searches. They searched using one search engine only (Yahoo was the most frequently mentioned) and employed single keywords. The next most popular method of searching was 'surfing the web' or browsing web sites and following links.

It is questionable as to how effective the described search methods were because:

- only 3 respondents mentioned using Boolean operators (which would have allowed them more control over their search)
- 24 respondents recorded they were 'not sure' how they searched
- 3 recorded they 'just type in the words and hope'
- Very few mentioned using 'Advanced' options if they were available.

Personal coping strategies

The range of coping methods described when unable to locate required information from the Internet was common to most participants. Many described feelings of frustration, anger, stress, disappointment and even crying as a result of carrying out unsatisfactory searches and locating unsuitable results. A typical coping technique was to leave the search and come back later to try again. The majority reported they eventually gave up as a coping strategy. The method most used to cope with not finding what was required on the Internet was to go to other resources, in particular books and journals, usually held in the library. This is of significance as an indicator of the enduring nature of the print collection.

A further coping mechanism was to seek assistance from other people. The majority of the respondents recorded they sought assistance from librarians. Many reported seeking assistance from colleagues and friends and some suggested they would seek help from online chat rooms.

Human-electronic interface

Problems encountered when searching the Internet

The problems recorded by survey respondents were similar in nature and severity to those described by discussion session participants. Problems were experienced across all user types regardless of experience or level of skill. The problems fall into two basic types:

Skills-based problems:

- retrieving too much information and retrieving too much irrelevant information.
- frustration with unsatisfactory results.
- inability to identify and select authorised information.

These problems reflect a lack of ability to limit searches and filter information. They are the result of only being aware of a limited range of searching and coping strategies, due to a lack of awareness of appropriate selection criteria to identify suitable information.

Technology-based problems:

- volatility of sites, missing web pages and changed URLs
- slow modem speed
- older versions of web browsers
- problems due to accidents with cables.

When modem speed is slow, loading web pages and other files can be very slow or fail to occur. Technological problems due to older versions of hardware and software can also be a barrier to students accessing vital information. Unforeseen connectivity problems sometimes occur which can have a major impact on the achievement of deadlines and over which the user has no control.

Internet training

Survey results indicate only one-third of all participants had received some form of Internet training. The undergraduate participants included the largest group of untrained Internet users. Only one third of the undergraduate participants had received any training. One half of the postgraduate participants had undertaken training and the majority of the academic staff participants had received some training. This lack of training has significant implications for both the university and the library in the light of an increasing trend towards online courses and information resources.

The lack of expertise as recorded by many of the participants may be reflected in the quality of the information retrieved. It may also be reflected in the lack of effective coping strategies

employed by searchers when faced with less than satisfactory search results and the high level of distress expressed by the participants as a result.

Types of training undertaken

Of those who had undertaken some training, the majority was 'self-trained'. Only 16% of the participants had undertaken training provided by the library, and only 5% had undertaken training provided by the university or other institutions.

Willingness to attend Internet training

In addition to investigating if and what type of Internet training had been undertaken, participants were surveyed to gauge their willingness to attend further training. Responses to this suggestion were evenly split with 47.5% responding 'Yes' and 52.5% responding 'No'.

The following suggestions were offered to account for the lack of enthusiasm to attend further training:

- The response could be a reflection of a common assumption that no training is required to utilise and manipulate the Internet.
- One postgraduate student suggested people are reluctant to give up time to attend training unless it was compulsory or an integral part of their course.
- It was also suggested that some people would prefer to suffer frustration using the Internet than betray their ignorance by seeking assistance.

Detailed tables of all of the survey data were compiled and published in the final complete research report.

Common assumptions about the Internet

The following set of assumptions about the Internet was compiled from suggestions of beliefs implied by the observed behaviour and discussed by participants. These beliefs were acknowledged to exist by participants who explored and challenged them through the enquiry. Real or implied belief in the assumptions by academic institutes has a direct impact on academic performance and success for students.

Assumptions:

- all required information is on the Internet
- all information on the Internet is accurate and authorised
- everyone is always able to locate the information they require
- training is not required to use the Internet; anyone can use it, even little kids.

All required information is on the Internet

Academic participants observed that not all required information is on the Internet. This is particularly true in the case of specialised information for medical and health sciences and for much research material published before 1995 from all disciplines. Another observation was that electronic journal coverage usually covers only the last few years.

All information on the Internet is accurate and authorised

The observation was made that due to the lack of control, editing, or rigorous academic scrutiny applied to material published on the web, the range of material available is very broad. For students to be able to select appropriate, authorised information they need to be equipped with a set of criteria and critical skills to analyse web pages.

Everyone is always able to locate the information they require

It was felt this assumption was flawed due to a number of issues. These included the impact of skills of the individual searcher to filter and limit information, unequal access to information due to differences in hardware and software and modem capabilities and the volatility of web sites.

These issues were of great concern to academic teaching staff, who require students to correctly cite web sites referred to in assignments. It was also discussed in relation to concerns of student plagiarism and a fear that students may not know the type of information they require or how to identify it.

Training is not required to use the Internet

Although not directly stated, this assumption is implied by the evidence of so few (only one-third of the participants having undertaken training of any sort. It is also implied by the lack of Internet training opportunities offered by the university for students to gain expertise in an activity of such academic significance. The array of negative personal experiences of frustration and stress recorded by students in response to their inability to locate information justifies a need for skills development through training of some type.

Responses to the Library Homepage

The majority of the participants reported using the library homepage and reactions to it were largely positive. The research provided evidence that use was limited to specific sites and that many participants were not aware of or exploited the full potential of the homepage to gain access to valuable services and information. In some cases, services and information sources acquired by the library to support specific research and teaching were not being accessed by the very groups who could most benefit from them. Participants reported this was often due to the complexity of navigation through the page to these sites. Other suggestions to explain under-utilisation of the pages were that the titles of pages or terminology used were meaningless to the user. The positioning of relevant links did not indicate their importance and in some cases significant sites were buried two or three layers down.

As a result of the research, the library gained a number of useful suggestions for modification to the pages to ensure greater utilisation. Amongst these were:

- include, as a design feature, greater reliance on the user being able to see what they need rather than having to reason where they can access what they need
- establish a Search option on the page
- feature access points to major sites from the top page
- improve publicity for the many services and features and emphasise the time-saving aspects of using the pages

- simplify the homepage by severely reducing the amount of text to read on the top page
- rename sites to more closely reflect their content
- arrange permanent links to the library homepage from school or departmental pages.

Outcomes

The researchers were able to apply findings from the research to plan and develop a program of Internet training sessions to best meet the needs of a range of participants. The training program includes instruction in searching skills and strategies and a set of criteria to evaluate retrieved web sites. Following collaboration with schools, subject specific versions of Internet training have been designed and presented as part of the undergraduate information skills program. The librarians have undertaken a review of marketing and publicity for the program to achieve extensive awareness of the program and ensure its attractiveness.

Many of the suggestions gained from the research have been implemented in the redesign of the library homepage. Prominence has been given to the most important and most used sites. In addition, the page now includes a Search option and much of the on-screen text has been modified resulting in improved clarity and more efficient navigation around the page.

Interaction with a wide cross-section of the university community has provided the opportunity for librarians to become aware of significant attitudes and responses to a selection of library-related issues. This valuable information has contributed to the library objective of achieving client-based services.

Issues and impacts

Barriers to learning

Fear of betraying ignorance

The issue of students being unwilling to ask librarians for assistance, as they are afraid of betraying their lack of expertise, arose a number of times throughout the research. It was mentioned in relation to undergraduate and postgraduate students and as part of the anxiety of mature-age students who are approaching research after some time away from it. This is a complex issue that will bear further research. This form of self-protective behaviour acts as a barrier to equal access to assistance and information and therefore to effective learning. Awareness of this must impact on the traditional way libraries provide and offer information assistance.

There is a need for studies to be carried out by libraries, librarians and their users to assess the approachability and inclusiveness of service points and staff and the accessibility of electronic information sources.

Some possible strategies to address this could include an evaluation of the approachability and effectiveness of the Information Desk both as a physical feature in the Library and as a major service point.

- Are these important contact points approachable, adequately staffed and do they allow for stress-free confidentiality during the reference interviews?

- Is the reality more likely to be long queues, busy librarians answering a number of queries at a time accompanied by noise and phones ringing?
- Should we be considering offering information assistance away from the Information Desk and at the point of research activity, by establishing a system of roving staff moving through workstation areas to answer queries as they arise?
- Should libraries be looking at an increase in the scope of electronic reference services to include more immediate 'chat' as well as email services as an alternative?
- Do libraries need to ensure all staff on service points undertake quality service training?
- What are the staffing implications for these suggestions?

Technological barriers to learning

Another issue raised through the research was the existence of technological barriers between students and the required information. Many of the technological problems experienced using the Internet and listed earlier in this paper, can be seen in this way.

Barriers arise due to different versions of university-provided and student-owned hardware and software required to access information. An example of this could be the necessity for a specific type of Internet browser and plug-ins to access online exam papers. Another area of difficulty can be homepages that frequently include sophisticated functions, requiring very fast modems and huge amounts of memory. Good graphic design of homepages is necessary for efficient, easy access to all available information.

A significant barrier is the lack of curriculum-based training to ensure users are equipped with expertise to make the best use of electronic resources.

Only one-third of the students involved in the survey had access to the Internet from home. This proportion was lower than expected and if it is representative of the entire student population, then there are equity and access issues to be considered here for students required to undertake online units as part of on-campus courses.

Much careful planning could be undertaken by the university and the library to ensure technological barriers do not arise.

Reluctance to undertake training

One of the more disturbing issues arising from the research is the reluctance of many unskilled and unsuccessful Internet searchers to give up time to undertake training to become efficient and effective users. This reluctance impacts on the academic achievement and success of students. It impacts on the university through success of online and distance courses and it also impacts on the library as the current major provider of Internet training to all students and staff in the university.

It encourages the library to collaborate with academic teaching staff to ensure the training is included in the curriculum. To attract as many clients as possible, it is necessary for the library to promote the training effectively by emphasising the advantages and efficiencies to be gained.

Conclusion

The Internet provides endless access to educational and research resources that are relevant and of value to members of the university community, wherever they are located. It is a mix of the extremely good and, like Pandora's box, the extremely bad. It is apparent from the research that our users have experienced both extremes.

It was also evident from the depth of frustration, anger and helplessness experienced when required information could not be located, that few of the research participants employed effective searching techniques or had strategies to 'kick-start' their unsuccessful searches. As the Internet is unlikely to diminish in importance as a major information source, this situation should be effectively addressed.

Evidence also suggests that libraries and universities need to constantly monitor their users' responses to maintain a relevant review of the accessibility and effectiveness of their homepages. In a constantly changing educational environment, where an increasing proportion of courses and required information sources are available in electronic format, it is essential that enthusiasm to embrace the latest technology should be tempered by consideration of the ability of the students to gain complete access to all resources.

The complete research report including tables of data collected from the survey is available as an electronic file and can be requested by email from the authors.

References

- Agius, R.M. & G. Bagnall. (1998) Development and evaluation of the use of the Internet as an educational tool in occupational and environmental health and medicine. *Occupational Medicine*, July; 48 (3): 337-43.
- Bierman, J.S. et al. (1999) Evaluation of cancer information on the Internet. *Cancer*, August 1; 86 (3): 381-90.
- Botluck, D. (2000) Update to search engines compared. *LLRX.Com*, July 15.
<http://www.llrx.com/features/engine3.htm>, 28/08/2000.
- Bruce, H. & P. Clayton (1999) An Internet role for the academic librarian? *AARL*, June 1999: 171-187.
- Chapman L. and Ivankovic H. (2000) "*Russian Roulette or Pandora's Box*": A report of an investigation into the usage of the Internet for research by the La Trobe University Community.
Request copies of the report as an electronic file from:
l.chapman@latrobe.edu.au or h.ivankovic@latrobe.edu.au
- Cook, A. (1999) *A guide to finding quality information on the Internet: Selection and evaluation strategies*. London: Library Association Publishing.
- D'Esposito, J. & R.M. Gardner (1999) University student's perceptions of the Internet: An exploratory study. *Journal of Academic Librarianship*, Nov: 455-461.
- Huberman, B.A. et al. (1998) Strong regularities in World Wide Web surfing. *Science*; 280 (No.5360): 95-97.
- Kibirige, H.M. & L. DePalo (2000) The Internet as a source of academic research information: findings of two pilot studies. *Information Technology and Libraries*, 19(1):11-16.
- Lawrence, S. & L. Giles (1998) Searching the World Wide Web. *Science*; 280 (No.5360): 98-100.
<http://www.neci.nec.com/~lawrence/science98.html> 19/11/2000.
- McCulley, L. (1999) Case study: Student use of the Library Web Page. *CLS99*. <http://www.library.carleton.edu/cls/study.html> 22/09/2000.
- Zipf, G.K. (1965) *Human behavior and the principle of least effort: An introduction to human ecology*. New York: Harper.