

# Learning to use the Internet as a study tool: a review of available resources and exploration of students' priorities

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## Abstract

*Background:* The Internet is a valuable information tool, but users often struggle to locate good quality information from within the vast amount of information available.

*Objectives:* The aim of the study was to identify the online information resources available to assist students develop Internet searching skills, and to explore the students' priorities in online guides.

*Methods:* A qualitative approach was adopted with two phases. The first was a structured search of available online study skills resources. The second comprised 10 group interviews with a total of 60 students at all stages of five undergraduate health and social care related courses at a UK university.

*Results:* The study found that there were good online guides available, but that, perversely, the better guides tended to require the best searching skills to locate them. A few students were enthusiastic about using online support, however the majority felt that if they had the skills to locate such resources they wouldn't use a study guide to improve these skills, and if they did not have the skills they would not think of using an online guide to develop them.

*Conclusions:* Students wanted assistance when they had problems or questions, rather than sites that offered structured learning experiences. Personal support rather than virtual support was also considered to be most important to the students in this study.

## Introduction

One requirement of the modern university is, according to Candy,<sup>1</sup> to develop students into effective lifelong learners. This includes having the skill and the knowledge to work effectively with information in the developing knowledge society, fuelled, at least in part, by the rapid development of the Internet which has moved information out of the library and into the community.

The Internet can be an excellent study resource and, with the wealth of useful information easily accessible through it, is increasingly being used by higher education students in the health and social care sectors. That wealth of available information, however, is also its main disadvantage, presenting users with the problem of locating good quality information from within the vast amount of information available.

Various studies have found that students have poor Internet skills. O'Hanlon<sup>2</sup> found that freshmen at a US university had poor skills in both searching and evaluating websites. Bond<sup>3</sup> found that nearly half (48%) of new pre-registration

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nursing students at a UK university felt that they ended up with too much information when searching on the Internet. In another study in a UK university, Slaouti<sup>4</sup> found that 13% of students, mainly undergraduates, made no use of the World Wide Web for academic study.

Once students have found information on the Web, Wood<sup>5</sup> asserts that they lack the skills to critically analyse the information they have found, making the assumption that 'all information is equal, truthful, and has the same value'. She also found that students do not understand or appreciate the reasons for, and necessity of, accurately crediting the information source. Slaouti,<sup>4</sup> however, found that students did not necessarily expect to have to find or evaluate their information sources, expecting lecturers to recommend websites, and that such websites would have been validated by the academic first.

Students need an understanding of the Internet and the services it supports, and the skills to undertake effective searches and evaluate the results. Evidence, however, shows that they are not starting higher education courses equipped with these skills. Goett and Foote<sup>6</sup> argue that students' prior home use of the Internet is not a good preparation for using it as an academic tool. Bond,<sup>7</sup> in a study of Internet users' search skills, found that people tend to self learn what they think they need to know and concluded that this approach was not very effective at developing basic search skills, and did not support users to develop problem solving skills.

According to Lazonder,<sup>8</sup> the ability of novice Internet users to locate websites could be improved by helping them to develop more advanced skills, for example by monitoring their search results and using these to improve their search performance. O'Hanlon<sup>2</sup> further recommends that, not only should students be taught Internet skills, but that the skills should be refreshed throughout the course.

There are a variety of resources available to help students understand the Internet and develop their skills, including online tutorials and study-skills books, produced by a wide range of authors with differing aims, and for a variety of audiences.

### Research background and aims

In a study undertaken by the authors with the support of a project grant from the UK Higher

Academy Centre for Health Sciences and Practice, there were two main aims of this project. One was to identify the resources that are available to help students develop the skills they need to be able to effectively use the Internet as a resource during their studies. The second was to identify the important elements of a study guide from the students' perspective and produce a tool to help them select appropriate sources of guidance. A full report of that study is available on the centre's website.<sup>9</sup>

The students in the study had all either received, or had access to, at least one structured taught session about using the Internet as a study tool. Their future use of online resources would therefore be supplementary to that; to help them develop their skills and knowledge further, or to revise the work they had already covered.

One problem identified was that, although the study sought to identify what students wanted in a study guide, a new issue arose from the research; that of the student's ability to assess and meet their needs. This aspect of the findings is developed further in this article.

### Methods

#### Identification of resources

Structured Internet searches were carried out through two common search tools, Google and Yahoo, to locate web-based tutorials and information sites. The search terms used were:

- learning;
- Internet;
- study;
- tool;
- resources;
- student;
- and synonyms of these words.

The 'exact phrase' option was also used with the terms:

- Internet as a study tool;
- Internet study tool;
- evaluating Internet resources;
- appraising Internet resources.

Recognizing the international nature of the Internet, no country limitations were placed on the searches. Commercial software packages were excluded from the research because of the limited

access that students had to these resources; students at most may have access to one package if it is supplied by their university.

The contents of the websites found were analysed, and grouped according to their key characteristics, especially authorship and target audience.

### Student views of essential requirements

Students' views were gathered through the use of group interviews. This method of data collection was chosen as it was hoped that within each group there would be a mix of experience and skills, and that students could use other peoples' ideas to help them develop their own. It was hoped that each group would be able to find some degree of consensus from the developing discussion.

As this research was carried out with students currently on courses within the researchers' institution, the ethical considerations included making sure that no student felt pressurized into participating in the research, and assuring anonymity. With this in mind, group interviews were considered to be preferable to interviews, as students would always have the presence of their peers for support.

Ten groups were identified from a range of undergraduate courses. The sampling was pragmatic, as only students who were attending sessions at the university when the group interviews were scheduled were included. A total of 60 students (minimum group size 4, maximum group size 10) participated in the research. As the students already knew each other, to a greater or lesser extent depending on their course stage, they fitted into Coreil's<sup>10</sup> classification of natural groups, these groups having already been formed for other purposes.

The students involved represented academic levels C, I and H; (equating to 1st, 2nd and 3rd year of an undergraduate course) and a wide range of experience, including students in the first few days of their course, to students in their final year; students on pre-registration nursing; post-registration nursing; BSc Health Studies; BA Social Work and BA Health and Community Development courses. No students declined the invitation to participate, and several commented positively about being asked what they wanted.

A semi-structured approach was adopted to ensure that all the interviewers (three in total) worked from

the same question framework. Students were encouraged to participate freely, and the interviewer ensured that the discussion did not stray off the topic and followed up comments, encouraging quieter members of the group to contribute. The length of the discussions varied, with a range of between 15 and 30 min.

## Results

### Available resources

Although the search terms used were not exhaustive, searching was stopped when only a few new sites, or types of site, were being located. In surveying the range of resources available to students wishing to learn how to use the Internet as a study tool, a number of categories emerged into which the majority of resources could be placed. The following category definitions, and their accompanying discussions, were based upon the evaluation of sites found using both a search engine (Google) and a directory (Yahoo). In each case, searching strategies were employed that attempted to mimic those used by web users of varying degrees of competency and experience, so that some sites were discovered 'easily', whilst others required more thorough, thoughtful searches. The importance of this to the overall evaluation of a resource is discussed later.

*Category 1—university/college library and affiliated services.* The most prevalent type of resource, and the one most likely to be encountered by inexperienced web users performing basic searches, is that produced by educational institutions, primarily for internal use by their own students. The results suggest that most higher education institutions have widespread access to the Internet and, of these, most will feature some form of resource-based support for students in order to enhance their study skills with the Internet. As many of these resources have an online version, the total number of pages falling into this category is substantial.

The structure, and the scope, of this type of resource can vary considerably from institution to institution, as is evidenced by the sites recorded in this survey. Some, such as the University of St Andrews' (UK) quick checklist,<sup>11</sup> and the University of Albany's (USA) resource,<sup>12</sup> are simply a collection of short online help sheets. Others, such

as the University of California at Berkeley (USA)<sup>13</sup> adopt a more structured tutorial approach, featuring in-depth analysis of the principles being taught, and containing practical exercises. There is also some variation on the method extolled for evaluating web resources, in that some institutions, such as Eastern Illinois University (USA),<sup>14</sup> promote specific scoring systems, whereas others provide a more general framework for evaluation, allowing students to decide for themselves how important a given aspect of a site is based on context. Examples include the resources provided by the University of Wisconsin (USA)<sup>15</sup> and the University of Newcastle upon Tyne (UK).<sup>16</sup>

Despite these variations, however, the overall scope of these resources is generally universal. The underlying principles remain the same, even although the amount of space and words given over to discussing the subject varies enormously

*Category 2—‘academics’ pages.* The second type of resource is related to the first, but rather than being the product of a centralized, ‘official’ outlet for research information within a university, these are resources produced independently by academics for their students’ use. They are often located on an institution’s servers.

An example is ‘Virtual Salt’.<sup>17</sup> The site features a mixture of discursive pieces on the theories and principles behind effective searching, evaluating, and other aspects of web-based research, as well as including some helpful, mnemonic-based checklists of things to think about. Whilst this latter aspect of ‘Virtual Salt’ is similar to the sort of resource provided by sites falling into category 1, the majority of the site is far more concerned with theory to be considered a framework of practical support. Indeed, ‘Academics’ pages such as this are more relevant to individuals researching the act of researching for and of itself, rather than students wishing to learn how to perform Internet research. As such, they also contain substantial bibliographies.

*Category 3—government/institution funded resources/initiatives.* The sites that are perhaps the most comprehensive, and often the most editorially sound, are those created through government and/or institution initiatives. They are often intended for a wider audience than those resources falling into the first two categories, and thus may have less of

an academic leaning, but as the principles of good searching and evaluation are generally cross-disciplinary, this is not a major drawback. Indeed, some sites, such as the RDN Virtual Training Suite (UK),<sup>18</sup> contain general advice as well as subject-specific help.

These sites often have a good range of off-site links that can aid students wishing to read further on the subject, and, as the sites are generally part of funded projects, these links tend to be maintained. However, the disadvantage with these sites is finding them in the first place; whilst neither hidden behind authentication systems nor possessing particularly obscure or long-winded URLs, the sheer wealth of category 1 sites means they do not readily emerge from the sort of searches likely to be performed by an inexperienced user. Sites such as the ‘Internet Detective’ (UK)<sup>19</sup> appear many pages into a basic Google search, by which time the inexperienced user who needs to find this resource may have given up. It does appear relatively easily on Yahoo, but only if a manual hierarchy search is performed using the site’s directory structure, rather than its more heavily promoted search feature.

*Category 4—the lone gunmen/women.* The final Internet category identified accounts for that most classical of websites: the private, one-man-or-woman-authored treatise. Such sites can vary greatly in length, motive, content and of course quality. Some, such as Study Guides and Strategies,<sup>20</sup> which employs user feedback as a quality mechanism and has been translated into more than 20 different languages, are more extensive.

*Category 5—hard copy resources.* There are a variety of books, and chapters or sections in books available to help students locate information on the World Wide Web. As with web resources, the extent, and usefulness, of these varies greatly, ranging from a few paragraphs in general study skills books such as McIlroy<sup>21</sup> to complete books, often aimed at a specific sector, such as Kiley<sup>22</sup> Medical Information on the Internet. This latter example, although not intended as a student study guide, does contain information that could be used in this way. One major disadvantage of hard copy information is its currency. The Internet is still evolving, and websites are often dynamic, with content changing and moving.

Even if the information is excellent when it is written, it is likely that links to websites suggested may become out of date quickly, possibly even before the book has reached the bookshops.

### Student requirements

Skill levels and prior use of the Internet varied widely across the participants, with most of the groups having a mixture that helped to stimulate discussion. Even although most students had already received at least one taught session, most students perceived themselves to have poor skills and voiced concern about being asked to use an online guide, stating a preference for a taught approach. Complete tutorials (category 3) were seen as something that they may be asked to use as part of a course, rather than something that they would find for themselves. This carried with it an expectation that the tutor would have carried out any requisite quality checks. Slaouti<sup>4</sup> also found this expectation in her research, where students expected that any link recommended by a lecturer should be fully quality checked by the lecturer. There was broad agreement from the students in this study that this type of guide should be introduced to them by the tutor, and that further help or assistance when they encountered problems was an essential requirement for this type of guide.

There was consistency in some areas of content requested, with all the groups stating that any guide used should contain more than just the mechanics of using search tools. All the students wanted help with conducting refined, targeted searches. Ease of access and a simple interface was mentioned by some groups, along with the ability to just use the help that was relevant to them at that time. Some groups thought that any support or tutorial used should be subject specific, along with the expectation that this would include quality checked links to further subject based websites.

The majority of the students wanted problem-solving assistance rather than a structured 'work through' tutorial. Help sheets, or help with resolving problems, were mentioned by all but one group. IT confident members of two groups were happy to consider help being provided through online means, although this was not supported by the less IT confident or skilled members of those

groups. In spite of the different professional groups included in the research, there was no interview group that had significantly differing views to the others. The amount of enthusiasm for online tutorials and support varied slightly between the groups, but those students who did have a preference for this form of support were always in the minority.

The problem of using online resources to help students develop their online information skills was raised by several of the groups who saw a paradox in that, without the skills and knowledge imparted by the online course, they would not have the ability to locate the course in the first place.

### Discussion

The survey of web results suggests that inexperienced users should have no trouble finding general category 1 sites, but would have problems finding the more preferable category 3 sites until they had achieved a greater level of skill in searching. This is a serious problem, considering the lack of refined searching skills which students looking for such resources are likely to have. Once they have found one of these sites, surfing to others is relatively easy thanks to copious hyperlinking (a feature which from this study would seem to be more extensive in the case of UK sites), but for the complete beginner there is a certain 'chicken and egg' paradox, a paradox which also extends into the area of site evaluation. Indeed, the category 4 sites in particular were prone to a certain lack of rigour in self-evaluation, and several would not be suitable for students to use as a basis for developing their skills. This suggests that, until the students have had an opportunity to develop a degree of skills and understanding, sites should be checked and recommended by staff.

The students reported the same paradox as the researchers identified. If they had the skills to locate such resources, they would not use a study guide to improve these skills further, and if they did not have the skills they would not think of trying to find an online guide to develop them.

Students did not expect to be left to locate their own online tutorials, rather they expected this to be included in the course, with a recommendation of a suitable tutorial being made. They also expected some training or guidance on using whatever was recommended, and for ongoing support to be available.

All but one group had already received at least one taught session on using the Internet, as this is provided early on in all courses. In spite of having received some education about using the Internet, the skill and knowledge levels varied considerably across the groups. It is hard to tell if having experienced a taught approach influenced the results. It is unlikely, as one group had also been given access to a commercial training package on the Internet. This group did not differ appreciably in their views from the rest of the groups who had not been given structured access to online materials. It would, however, be interesting to structure some further research to divide students into two groups, 'taught' and 'online', and then repeat the group interviews.

None of the students in this study was studying at a distance and, although different courses used varying amounts of blended learning, this was within the context of a student body who considered themselves to be on a 'traditional' course, with regular attendance at the university. The professional students who spent periods of time in placement did not have different views on online support to their solely university based colleagues.

Fields<sup>23</sup> found that students' decisions about their information needs were driven by convenience rather than by matters relating to the quality of information located. This research had started with the aim of exploring the aspects of an online study guide that health and social care students considered to be the most important for them. What the study found, however, was that what was most wanted by the students was personal, problem-specific help available at the time of need. In keeping with Fields<sup>23</sup> findings, students were not as keen on the less convenient option of spending time developing their skills and knowledge.

The authors (and the students) rejected the notion that students should locate resources to help themselves improve their skills; the authors for several reasons:

- sites are of varying quality;
- students lack the skills to know what a good Internet study guide is;
- the most comprehensive sites are the hardest to locate;
- students lack the skills to search for these sites effectively.

The students' rejection was based on different criteria:

- did not want a structured site they had to work through;
- did not feel comfortable about using online help if they had poor skills, or low confidence in their skills;
- they wanted quick access to immediate problem solving;
- personal support was considered preferable to online help by most students.

Few of the sites, even the category 3 ones that the authors consider to be the most comprehensive, meet the need for the timely problem solving assistance students prioritized.

Some of the sites located in the search did have a menu of contents readily available. In some cases, these contained so much information it is easy to imagine that students who want to quickly locate an answer to their question would be put off. In others, especially more comprehensive tutorial sites where registration was required, this information was after the registration stage and again students would most likely move on before they found the information they were looking for.

Students identified that they wanted a human interaction. The Internet does have the potential to offer the personalized help that students want. This could be through well structured searchable help sheets, or through message boards where questions could be posted and either a tutor, or other students, could offer advice. No site located in this research, however, offered personalized assistance. This does not mean that it is not available somewhere on the Web, but if the searching strategies adopted by the researchers did not locate it, it is unlikely that searches carried out by in-expert students would.

This study included a range of health and social care students, many working towards a career in the UK National Health Service, or Social Services departments. There is no reason to think that these results are not transferable across the health and social care sectors. It might be expected that students who have chosen a career in an IT related profession would have a different attitude towards online support, however, these results may also be of interest to any professional educational

provision where the use of computers is incidental rather than central to the profession.

## Conclusion

The reluctance of students to use online resources to help them develop their information skills could result in their missing some excellent educational support mechanisms. Two key problems underlie this.

- lack of IT skills, or lack of confidence in the skills leading to reluctance to use online resources;
- poor awareness of required skill levels, and a lack of ability to judge their own skill levels.

The way resources are introduced needs to be structured within the overall course design. Where online materials are used as part of a blended learning approach, the way they are introduced and supported needs to be congruent with that approach. Students in this study were reluctant to accept online help in preference to a person-to-person interaction.

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## Key Messages

### Implications for Policy

- Although the Internet is potentially a good source of a wide range of information, students lack skills and knowledge to use the Internet effectively.
- Education in the effective use of the Internet should be embedded in undergraduate programmes. This must include understanding of the evaluation of information found, as well as the skills to locate information effectively.
- Support must be provided for students who lack the necessary skills and knowledge to use the Internet effectively to support their studies in a way that meets students' needs.

## Implications for Practice

- The highest priority for students is quick and easy access to help when they encounter problems or have questions.
- Some students are happy to consider using online support services if they meet their needs, the majority however prefer face-to-face assistance.
- Many students are not confident about their ability to use online support systems.

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