

EDNER

Formative Evaluation of the Distributed National Electronic Resource

**Stakeholder consultation and analysis – information
usage in higher education**

EDNER Deliverable DA3a

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EDNER – the formative evaluation of the UK higher education sector's Distributed National Electronic Resource (DNER) – is a three-year project being undertaken by the Centre for Research in Library & Information Management (CERLIM) at the Manchester Metropolitan University and the Centre for Studies in Advanced Learning Technology (CSALT) at Lancaster University. Details of the project's work and copies of published reports are available at <http://www.cerlim.ac.uk/projects/edner.htm>

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1 Introduction

The purpose of this deliverable report is to identify the information seeking activities of academics within the higher education sector and to relate these findings to the Information Environment (IE). These academics include lecturers, researchers and students across many subjects with the Faculty of Humanities and Social Sciences, at a post 1992 University.

This report presents the results of discussions with lectures, researchers and students. These discussions were conducted in two phases - during Phase I lecturers only were interviewed, during Phase II lecturers, researchers and students were either interviewed or took part in focus groups. The results of this research are presented here in the form of vignettes, which are used to interpret a particular incident and use this to illustrate a more general situation.

2 Literature

2.1 Information seeking behaviour

It has been said that the origins of modern information retrieval research can be found in the Cranfield experiments of the 1960's, which by using rigidly controlled experimental conditions, attempted to place information retrieval (IR) system evaluation on a sound scientific basis, and soon became the exemplar for evaluation of information retrieval system effectiveness (Harter and Hert 1997, p.8)*not in list of references*. However, the Cranfield model has always had its critics (Dervin and Nilan, 1986 and Cooper, 1973), and many researchers in IR began to call for a user-centred evaluation paradigm. The Cranfield model is "perhaps best understood as a child of its time" (Hildreth 2001, p.2). It reflected the technology and retrieval environment of the 1960s, whereas the user-centred model and new evaluation methods reflected the IR technology of the '80s and '90s, where 'end users' of systems were growing increasingly common, through increasing access to online catalogues and CD-ROMs.

For example, Ellis (1989) created a behavioural model of six characteristics by studying the information seeking patterns of social scientists, through tape-recorded interviews with academics from various departments within the social science faculty. These interviews "provided enough information for a detailed and accurate account of the perceptions of the researchers of their information seeking activities to be possible, and to enable an authentic picture to be constructed of these activities" (p.175). In the conclusions it was stated that "the general principle of using the behavioural aspect of users' information seeking activities to inform the design of information retrieval systems is more widely applicable, and could play a more prominent role in the design of computer based information retrieval systems than, at present, it does" (p.202).

Similarly, Bates (1989) undertook research that attempted to understand the "real behaviour" of information searchers (which she argues is not the case with the "traditional model of information retrieval") from which evolved the 'berrypicking' model of information searching. It was hoped that this would "guide our thinking

better in the design of effective interfaces" (p.407). However, Bates (1990) also reminds us that identifying differences between system factors and user factors is no easy task.

2.2 Subject discipline differences

A number of studies looking at differences in discipline and how they might affect information needs and information seeking behaviour have taken place. For example, Ellis, Cox and Hall (1993b) analysed the information seeking patterns of research physicists and research chemists in order to effect a comparison between these and the patterns of the social scientists investigated in a previous study (Ellis 1993a) in order to identify differences and similarities between the two groups. Minor variations were identified, but fundamental differences could not be determined.

In Whitmire (2002) data was used from the College Student Experiences Questionnaire, and the Biglan model of disciplinary differences was applied to distinguish differences in undergraduates' information seeking behaviour patterns. It was found that certain types of academic library services may favour one group to the detriment of others, according to whether they belonged to the 'soft or 'hard' discipline dimension.

A study by Herman (2001) examined the transition to the electronic information era in academia and identified the influence of disciplinary-rooted differences in the conduct of research and their influence on information needs. It concluded that "although scholarly research proceeds within a clearly discernible generic framework, the academic culture surrounding the disciplinary areas brings about characteristic differences in thought processes and work habits" (p.399).

Similarly, although research into how task differences might affect search performance has been carried out (for example, Saracevic and Kantor, 1988, Marchionini, 1989, and Kim and Allen, 2002), these studies used set tasks and looked at how, for instance, complexity of task affected precision (Saracevic and Kantor, 1988). The experimental design of these studies meant that disciplinary differences, and the academic status of the user, were not taken into account.

Work undertaken by Brophy et al (2003) examined the literature on user information needs of academics by subject discipline and by status (lecturer, researcher and student) and conducted some analysis of the raw data made available by the study undertaken by the Digital Library Foundation (Friedlander 2002). This work found differences in the information needs and information type use related to different Faculties and academic status. They recommend that further work needs to be undertaken to examine this in greater detail and in the light of networked information services.

2.3 Other variables affecting information seeking behaviour

It is acknowledged that to fully understand the process of information seeking from the user's point of view, it is imperative to examine all the factors that may impact on that process. However, Fidel and Soergel (1983) *not in list of refs* pointed out the difficulty in identifying and understanding all of the variables present in the information seeking process.

Saracevic and Kantor (1988) examined a variety of these user variables - for example, past searching experience, cognitive characteristics, motivation for searching, etc. - as they believed that the success or failure of IR systems "depends not on increased sophistication of technology, but on increased understanding of human involvement with information" (Saracevic and Kantor 1991, p.47). Kulthau (1991) studied the users' perspective of information seeking by examining the cognitive and affective aspects of the process of information seeking. Reneker (1993) undertook a qualitative study among academics looking at the variables of perceived environment, source use, personal characteristics and satisfaction with results. Nahl and Tenopir (1996) looked at factors such as the users' purposes and motivations, their choice of search strategies, their affective, cognitive, and sensorimotor behaviours, their questioning behaviour, and their levels of satisfaction with results. Ford, Miller and Moss (2001) have studied the role of 'individual differences' in Internet searching, which consisted of age, gender, study approaches, prior experience and cognitive style.

3 Research methods

3.1 Qualitative research methods

Qualitative methodology has been described as “studying the behaviour of individuals in all the complexity of their real-life situations” (Bawden, 1990, p.27). This is particularly relevant to studying information-seeking behaviour, where frequently in the past, studies have been based around artificially-constructed experiments, or else relied on large-scale surveys, making use of instruments such as questionnaires (Bawden, 1990). However, as Wilson (1981) stated “though useful in terms of providing generalised descriptions of certain aspects of information-seeking behaviour, survey research appeared to provide little in the way of insight of motivations for information-seeking and little in the way of discrimination between different categories of users that could guide information service practice”.

Thus, there would appear to have been a change in focus in some information-seeking research, with some calling for a “paradigm shift” (Reneker 1993, p.489). It has been noted that “traditional approaches...have aspired to sophisticated quantitative techniques...Yet in the context of the impetus of the paradigm shift, scholars are now calling for supplementing quantitative approaches with inductive, qualitative approaches” (Dervin and Nilan 1986, p.16). Whilst the qualitative research approach has been criticised (for example there are no clear hypotheses to be tested, samples are small, data does not allow for statistical analysis and results reported tend to be descriptive) many researchers consider these disadvantages to be outweighed by the benefits of qualitative research. Taylor and Bogdan (1984) consider qualitative research to emphasise validity because “the methods are designed to ensure a close fit between the data and what people actually say and do” (p.5). They believe that qualitative methodology refers “in the broadest sense to research that produces descriptive data: people’s own written or spoken words and observable behaviour” (p.5).

3.1.1 Vignettes

Qualitative results need to be analysed and presented in a different way from the results of quantitative surveys – that is, tables, graphs and statistical analyses. Instead Bawden proposes, “it will usually be better to present the results in an appropriate, and genuinely qualitative style, appropriate to the richness of such information” (1990, p.31). This ability to express the results of qualitative studies as narrative is a very significant advantage as it “gives a better ‘flow’ than can even the best annotated tables of statistics” (Bawden, 1990, p. 32). One method of presenting qualitative results is the use of Vignettes, which have been described as the evaluator (or researcher) interpreting a particular incident and using it to illustrate a more general situation (Stenhouse, 1981).

The vignettes reported in the results are based upon incidents related during the interviews by participants describing the last information need they had and how they went about satisfying those needs. However, each vignette is based upon more than one interview, so although they would seem to reflect only one person’s experience, they are in fact a reflection of the experiences of all the participants, divided either according to type of academic or discipline. They are labelled according to whose experiences are included within that vignette – therefore, although the Researcher vignette (for example) includes data about information seeking within the discipline of languages, it reflects experiences and opinions, comments and quotations, from all the interviews with researchers, and so has been labelled as such.

3.2 Implementation

3.2.1 Phase I - Lecturers

The aim of this phase was to explore what kinds of resources lecturers were selecting to support their online teaching modules, how they sought such resources, queried the role played by university librarians in the discovery process, and asked how lecturers were presenting the resources to their students. The lecturers who participated had all recently expressed an interest in using a Virtual Learning Environment (VLE), namely WebCT, as a teaching tool. All had had some degree of training in how to use the various facilities offered by the VLE. The training had not included in any great depth the embedding of online information resources, beyond

indicating that linking to these was a possibility. The emphasis was not upon the skills and practices of the individual lecturers when developing their VLE. It was clearly focused upon their attitudes towards online information resources. This group was chosen because their interest in the online teaching environment suggested a general interest in online resources and environments.

The Learning and Teaching Unit which provides training for lecturers, was asked for a list of staff across the university who were delivering their teaching in part or entirely through a VLE. The list was surprisingly small, with only 39 names. An introductory email was sent to all staff on the list explaining the purpose of the interviews, and requesting assistance. Face-to-face interview was the preferred method of investigation, but an email questionnaire was offered as an alternative to those lecturers who expressed willingness to help, but were concerned about the time commitment involved. This dual approach led to a response of over 60%, but it quickly became clear that several lecturers had 'dipped their toe into the water' and then decided not to deliver their teaching in this way. Five said they had done the training but were not currently using a VLE to deliver teaching, three were using the discussion group facility only, one was using the VLE as an online reading list but with no teaching content, and one was using the VLE to publicise netball scores and nothing else.

Fifteen positive responses were received, covering the business, science and engineering, education, law, food technology, humanities and social sciences communities. Seven offered hour-long face-to-face interviews and the rest preferred to respond by email questionnaire. The email responses were received very quickly, and helped steer the more in-depth interview discussions.

3.2.2 Phase 2 – lecturers, researchers and students

Phase II of this research involved the participation of academics working across a variety of disciplines and academic status, that is, lecturers, researchers and students. Participants were recruited from six different disciplines within the Humanities and Social Science faculty at Manchester Metropolitan University. The departments included were the Economics, English, History, Languages, Politics and Philosophy, and Sociology departments. The Department of Information and

Communications, although belonging to the Humanities faculty, was excluded due to participation of some students in previous user testing for the EDNER project (Report deliverable DA2, *DNER service evaluation*, Brophy et al 2002a).

In all ten individual interviews were conducted, consisting of four lecturers (from the Economics, English, Politics and Languages departments), five research students (from the History, Economics, English, Sociology and Languages departments) and one undergraduate (from the History department). Nine more undergraduates from the English, Languages, Politics and Sociology participated in two group interviews. Group interviews are similar to focus groups and have gained popularity in many fields of social research as they are easy to carry out and “an efficient way of generating substantial amounts of data” (Robson, 2002, p. 284).

3.2.3 Interviews

Interviewing as a research method is very widely used in all fields of social research and flexible, qualitative designs often make use of semi-structured and unstructured interviews (Robson, 2002, p. 271). It has been said that interviews are essential to the collection of qualitative data, since “a verbal discussion is the best way of getting an in-depth understanding of a situation from the viewpoint of a participant” (Bawden, 1990, p.33).

3.2.4 Critical incident technique

The use of critical incident technique during the interview was useful in elucidating participants’ typical information needs and the information seeking process that they undertake in order to answer those needs. Critical incident technique (or CIT) is a qualitative research method, in which participants are asked to provide the researcher with anecdotal information about the last time they were in a particular situation, what led them to be in that situation, and what the results were. Since its development over 50 years ago, CIT has been used in hundreds of published studies related to various fields of research. In IR research, CIT has been used to examine the impact of bibliographic databases (Wilson, et al. 1989), and the effectiveness of user interface designs in general.

4 Results

4.1 Phase I vignettes

4.1.1 Food and Consumer Technology Lecturer

Lee lectures on Food and Consumer Technology. His Department teaches science (chemistry, microbiology, physics) in the context of food, food manufacturing, and food preservation and quality. Management, economics, human resource management etc. are also taught.

Lee teaches on a broad spectrum of degree and HND courses. The only JISC resource with which Lee is familiar is the Virtual Training Suite, though he does not use it with his students or link to it from his VLE. He has heard of the RDN, but did not realize it was a JISC resource.

He is, however, a keen user of online resources and recommends them to his students. He has the sites book marked and referred to them frequently during the interview. Lee particularly likes Merlot, because it has 'websites which are peer recommended and evaluated'. He describes Merlot as being a 'bit like the RDN'. He also likes foodlineweb, which is really a subscription service with some free content. Lee has noticed that the free content is diminishing, and is considering asking the librarians about subscribing to foodlineweb, as it has information about food science and technology, market intelligence and food law. He also recommends the Institute of Food Science and Technology (IFST) website which he describes as a 'very professional site'. Other favourites are the British Nutrition Foundation and Justfood. As well as websites Lee uses online journals, and is very keen on Butterworths for food and drink legislation and food quality issues.

Lee hears about resources in various ways. Some are tried and tested resources that he has been using for some time. Colleagues in the Department recommend others, though he describes it as a 'not very sharing Department'. Other

recommendations come from his reading of professional literature, from the meetings he attends, from conference handouts and discussion with conference delegates. He rarely hears about new resources from students, but can think of one who used to email him regularly saying ‘have you seen this website’ but this is the exception rather than the rule. Lee often finds new things by browsing through his favourite websites and following links. One site, Justfood has an alerting service which is very good. He particularly likes doing web searches. ‘It’s such fun finding things yourself.’ He also very much likes books, and has noticed with alarm that the number of books available on his subject seems to be diminishing, but he is not quite sure why this is.

Lee most definitely encourages his students to use the Internet. He is impressed by ‘the web explosion’ but reminisces about the early days when the whole thing was much smaller. He is excited by the serendipity of web searching. Students, however, he feels are a bit unfocussed. ‘They find trivial things and bring them to me’ he says, ‘even at Masters level, and then I have to draw their attention to fact that they would not bring me this sort of content in a paper based resource.’ He describes their confusion as ‘a bit like not discerning the difference between a popular magazine and an academic journal’ yet says he thinks that in general they have adequate skills, or if they don’t they quickly develop them. When asked how he thinks students develop information evaluation skills, Lee admits that he doesn’t mind helping them to evaluate websites, and explaining how to do this, but he doesn’t do it ‘in a formal way’.

Lee has a very good relationship with his Departmental Librarian. He works on a small site, and sees library staff most days either in the Library or the refectory. He claims ‘I love them all. They are great.’ He says his Department has exceptionally good librarians who are always supportive and helpful. They take time to learn about the different subject areas and are then very proactive. He particularly likes their alerting services. Lee sees the Librarians’ role changing. As well as monitoring the environment for resources and then alerting staff to them, he sees an emerging role for them as trainers of staff and students. He has been to several talks by librarians and has always learned something new. He cannot understand why these sessions are so very poorly attended by other staff. He is also worried that journal subscriptions might be withdrawn if students don’t use the journals, so he encourages students to use the library.

4.1.2 Business Lecturer

Moira is a Lecturer in the Business Studies School. She teaches on Business and Information Technology courses.

Moira uses online resources regularly with her students, as there is a culture of doing so within the Business Studies School. She reports that several of the different Departments within the School have produced their own websites and intranets over the past few years, and a common intranet with extensive resource links is being developed for the whole School. Moira encourages her students to use these links to online resources. ‘It is a requirement that they use them’ she says. Moira links students to subject gateways but was not familiar with the RDN or the VTS.

Moira gets to know about online resources in various ways. For the unit that she teaches, she gets them from Business World and other professional journals, and from discussion groups. She also thinks that the library is very good and links her students to the managed online resources that the library provides, though she does not mention face-to-face liaison with librarians. Moira doesn’t spend a lot of time searching for resources, but throughout the year she compiles a list of ‘useful things’ as she comes across them during her reading or web browsing. Then once a year, usually in the summertime, she trawls through these and pulls them together before updating her online links for students. ‘It’s a sort of annual activity in the summer vacation time’ she says, ‘It’s a case of having time really to do it.’

Moira definitely encourages her students to carry out their own Internet searches and to evaluate what they find. ‘I want them to find suitable resources and put them in their work’ she says. Moira believes that her students have the skills to do this because they are taught searching and evaluation as part of their course. ‘It’s because of the subject area; its integral’ she explains. ‘They’ll have to use it in the workplace. We’ve a skills oriented approach. We have a great interest in the technology and what it can do. We have a wide range of skills, from HND to masters, and they’re trained in Internet evaluation skills. So we expect them to be able to use it wisely.’

Moira remembers a time a few years ago when she tried to get students to build up a resource of online links themselves. She had asked them to find five resources, a book, journal article, website and so on, and to write a description of it and give its URL. But it took a lot of doing. Some students did it while others didn't, so she has not repeated this particular exercise.

4.1.3 Clothing Design Technology Lecturer

Norman teaches clothing, textiles and business management, and uses WebCT to teach statistics.

Norman is very keen on online resources and seems to be a skilled searcher and evaluator. He regularly recommends that his students use BizED and SOSIG and finds them very good. He likes SOSIG because the links don't 'go up and down', and says it is particularly good for statistical resources. He's aware that SOSIG is a Gateway and clearly understands the difference between a subject gateway and a search engine. He's also used Bnet in the past and liked it too, but now that it is subscription he can't use it any more, as it's quite expensive. In any case, he'd looked at Bnet again 'and it didn't seem to offer any advantages over BizEd and our own resources.'

He also likes particular commercial resources especially those dedicated to clothing. He likes just-style, even though it is subscription only and the Hong Kong apparel.net despite the fact that they plagiarise material from other places. He knows this because he's seen material that they've put up and 'it looks like they've generated it, but I know the original sources.' Because of this he tends to use this particular resource for his own work rather than send students to it 'as they'll pick up bad habits'. He also thinks BoxMind does a good job and uses that himself even though it's more student facing because he thinks it has 'quite an intuitive way of directing you towards resources.' His favourite commercial search engine is Copernic, which he thinks is 'a cracker', though he only uses the basic free version. He finds Copernic more than adequate for general research because 'it will search a load of search engines for you. It isn't one in its own right it just polls other engines for you.'

In his opinion, Copernic isn't the best for supporting academic work, but is a good 'quick and dirty way' of getting information from across commercial sites.

As well as subject gateways and commercial websites, Norman uses the University Library website, despite the fact that he doesn't think it is very intuitive to use. He particularly likes the filtering service which the library provides, their 'weekly research bulletins' though he thinks the service is a 'well-kept secret. If you know about it they're good, but I don't think all academics do. It's something you have to vote yourself into.' He thinks alerting services are really quite important because 'things are developing so fast and its handy if someone's filtering it out for you ... its timesaving. I haven't got time to do it'. He has regular contact with Librarians but agrees that this may well be to do with the fact that the library is located close to his workplace. He fears that his current good working relationship may be something that will disappear in five years time when his Department is relocated, but it might be that other strategies will develop so that 'instead of it being a goodwill thing it will become more formalized.' He thinks there is a scheme where students can book time with librarians, but is not quite sure about that.

Norman has identified a number of problems for his students when working in the online environment. He encourages them to use the Internet, but has some reservations about their skills and competencies. He claims that they 'might love it for chat and their own personal ends but I'm not sure for work'. He had expected that providing statistical resources online would be problem free, assuming that this was how students liked to work, and that they would enjoy working from home at their own pace. However, he was surprised to discover that even logging into the university network was a challenge for some students. He now feels that working in online environments removes one set of problems, namely the need to go to the library and scan up and down the shelves, but puts other pressure on students, inasmuch as they've 'got such a surfeit of information that sometimes it can take as long to weed out and visit the hopeless stuff as to go to the traditional library.' 'It's almost got to the stage now that we've got so many resources that it needs some work to help people into it' he claims. Norman also thinks that students find resource seeking and evaluation very time consuming. He believes that they waste much time looking at sites that have little relevance before discarding them, and that this is a major drawback of the Internet. He says 'I think if they could hit on a relevant site quickly I'm sure it would make life easier for them, but I think that anybody that uses the internet just knows that there is so much information there and so many different

ways of hitting on it that we don't seem to have come up with any sure fire way of getting it to give us the information that we want.'

Norman does not think that his students have adequate training in searching skills, and in evaluating what they find. He further identifies the problem of who should provide this – the university, faculty, department, library, the course or the individual tutor? He attributes this lack of clarity to the newness of online resources, saying 'I think again because it's new there's no protocol about whose responsibility it is'. He also questions where the time would come from to teach these skills. 'Do you chop stuff out of the curriculum to give them that training? Is it an extra so no marks, no incentive to them to sign up for it?' he says. A possible solution might be to provide skills training through an induction programme, and he himself has provided links in his WebCT module to appropriate sites, but this is not a formal requirement. He is aware of the RDN and the VTS, and says that he would choose one of the economics or business studies tutorials for his students, but does not state that he actually does so.

Norman is also not confident that in time students coming up through sixth form college will be better skilled. He believes that provision in schools is 'patchy' and that the quality of the hardware and training found there is mixed. Nor does he think that the proliferation of home computers will ensure good skills, but fears that instead students will come to university with bad habits, which are hard to break. He also points out that the student profile in his Department includes many mature students whose skill levels on entry cannot be taken for granted.

4.1.4 Networked Information lecturer

Olwen has taught on many courses in her Department including one which teaches students how to use networked information resources. Olwen links to many different sites for the different modules she teaches. These include search engines and directories, individual websites such as government, professional bodies, community associations and poetry sites.

Olwen finds out about resources through her own reading of professional journals, newspapers etc., by attending courses and conferences, through networking with

colleagues, especially cross-university colleagues who she met while doing her WebCT training, through web searches though she finds these time-consuming because they require a lot of effort for evaluation. In addition students, especially part time students who are out in the workplace often suggest sites, and when she has evaluated these, links are sometimes created.

She does liaise with librarians but not for online resources or websites. She mostly goes to them for training for herself and her students, and also when she needs their services, such as information about new passwords.

Olwen says that skills training for students is not a problem as it is an integral part of her Department's work, but she can see that it might be more problematic in other parts of the university. Skills training is very time consuming and it would mean taking time out of another course in order to fit it in. In Olwen's experience students often come on her courses with the idea that they are already skilled, but that commonly after a couple of weeks they realize that they know very little.

Olwen does encourage her students to use the Internet, but only in a very directed way. This is largely because browsing and information seeking is very time consuming, and the way in which students' time in the Department is arranged means that they have little free time. She says that if you want students to do this, you have to give them time out of your allocated lesson time to do it. Part time students in particular have six hours of lectures on their day in university and full timers can have very crowded days indeed. Some don't even get a lunch break. Otherwise they are working, or don't have access to a computer. Time to 'surf', even with specific aims in mind is quite a luxury.

Because of her subject area, she is familiar with JISC resources and has found many good things among them, especially BIDS, COPAC, and Netskills. She is aware of the VTS, but says that there isn't a tutorial for her subject area. However, she thinks that the tutorials are good. It's difficult, she says, because students and lecturers can want something very focused indeed and it is hard to provide such a range of materials. The advantage of JISC stuff is that it is managed. It's unlikely to disappear without notice.

4.1.5 History Lecturer

Pat is a very enthusiastic user of WebCT despite the fact that she found the training sessions difficult. She is also enthusiastic about online resources. She teaches History, particularly Modern History.

Pat links her students to a wide range of resources. She has created a WebCT module exclusively for part time students, from which she links them to things like the library, student services, counselling, and some basic information of the kind they get from the student handbook. She says that this is not really an academic unit as such, it's more to give a sense of community - though very few are actually using it.

In her teaching modules, Pat has used online resources to counter a number of problems. She had noticed that students were reluctant to go to the library with their reading lists to look up information in books and journals. Also because of the currency of some of the issues she teaches, her reading list quickly became out of date. So instead, Pat has found online materials that she thinks are relevant and has created direct links to them. She has had to be quite selective, because potentially 'there's a vast amount out there.' So for example, when covering the Cold War she uses an American website with primary documents, which provides quite good papers and pictures. She has also linked to documents online at Yale University, where there is a vast archive of legal documents to do with the Cold War. The documents are too long to print out as a handout but because it's all there she says that her students can browse through it online. One pleasing outcome of this is that she has definitely seen evidence of resource use in the students' work. This was often not so with paper handouts. Pat has also found and used newspaper articles about the Cold War as the basis for a quiz. Because these are online it has helped guard against complaints that students couldn't do the work because they couldn't get hold of the resource – 'if its online they can get it when they need it' she says.

Pat has also found online maps useful for those students whose Geography is weak. 'When I look at Decolonisation, they can actually look at a map of where the countries were, where the empires were, and of course they can also get hold of

these throughout the whole year' she says. She has also found policy statements online, press statements from governments, and speeches by key politicians. These have all been useful. Pat is aware that video material is available online, but has not used this, partly because she is not sure how to do it and also because she is concerned about copyright. Instead she gets videos from the library.

Pat has also created her own online resource, a glossary of history terms with hyperlinks from the text in her teaching materials. Course feedback had told her that students were finding some terminology difficult, so she looked for an online glossary. As she could not find one, she wrote her own and has had favourable feedback.

Pat reported that another problem had been a dearth of 'traditional' library resources for some of her very current study areas, most notably post communist Russia. To counteract this, she had found links to web-based journals and had created a reading list based on these. Parts of the reading list are more pointers to materials such as the conflict in Chechnya, or NATO foreign policy.

Pat has not always found it easy to use online resources in teaching though. She has had problems with websites disappearing, and had no strategy to counter this. 'I had a fantastic piece of a course based on a website with quizzes, it had pictures, speeches from politicians etc. and it suddenly disappeared and so I'd lost my course' she said. Other website links kept breaking intermittently, which was annoying. The Chechen links in particular were regularly hacked into by the Russian government and disappeared. Pat's students seemed to blame her if the links didn't work, so she had to explain to them that 'this is what politics is like'. And 'there's a war going on'. She says 'they get a kind of injured innocence if they click on something and it doesn't work'.

Pat has also used individual articles from websites as a basis for seminar discussion. For example, her first seminar of the year was on Russo-phobia and there was a very good article on a website which got her students focusing upon their preconceptions about Russia and Russian people. The tracking facility told her that only a quarter of the students had read the article before the seminar, but Pat thinks that this is more

than would have read a paper handout. She believes that students are keener to use the online environment where you can use quite a range of media. Her feedback has been generally positive from the students. It seems that if they click on something they are more likely to read it than if they are scanning books and journals. They also like the fact that they can do some of this from home and they don't need to come in to the library. Although Pat says she still finds some resistance to doing any work whatsoever, she definitely thinks her students are benefiting and learning from the online medium.

With regard to students' searching and evaluating skills, Pat has introduced some skills training into her online modules. One of these is an introductory module using online materials which leads them into their dissertation, and which is much more skills-based. For this Pat created a website and linked it to anything she thought was relevant. Thus her website teaches skills while being focused upon the particular needs of her course and its students. For example, she has linked them to various sites that explain the difference between primary and secondary historical sources, because they are 'very poor at understanding the differences between the two'. For this Pat reused an American website so as to avoid 'reinventing the wheel'. She has also linked her students to the VTS history tutorial, which she found very useful, and better than Internet Detective. She has found that her weakest students can cope with the VTS tutorial, while the better ones 'just fly through it'. Pat is pleased that they are learning to evaluate information. She had observed that they would use websites very uncritically, even less critically than they would books. 'They would evaluate critically books and articles,' she said, 'but with websites they ... for some reason they just glaze over and assume its true.' Her only criticism of the VTS is that dyslexic students have found it difficult to cope with the split screen, and she has had to 'talk students with dyslexia through it this year, whereas last year it wasn't an issue.'

Like Moira, the Business Studies School lecturer, Pat also 'does a bit of housekeeping' over the summer period, which involves checking that all web links are still live, and identifying where she can use new materials which she has found over the past year. She has found that 'online is a lot of work'. She feels her colleagues don't see her do the work now. It's 'invisible work' and they think she does less, whereas Pat claims that the effort is 'shifted round' and that in fact she has

more online contact with her students, and uses face-to-face time for problem areas. She doesn't think that working in the online environment and using online resources has saved her any time whatsoever. She 'thinks it will maybe in a few years but it doesn't now'.

4.1.6 Law Lecturer

Emily is a Law Lecturer who runs several WebCT courses. All of Emily's courses have direct links to online resources of one kind or another. She uses a combination of methods to find out about suitable resources, such as relying upon her prior knowledge of mainly government websites, from web searching, or from a colleague who passed her a list of useful Law URLs she had been given at a conference. Her mother had even spotted a couple of resources listed in Education Guardian and emailed them to her.

Emily links her students to the library homepage from her WebCT modules and to the library subscription subject databases. She is a huge fan of the specific legal databases that the university subscribes to - Westlaw, Butterworths Direct etc which she does feel encourage the students to undertake primary legal research, now that they can do so without moving from the home computers! She believes this has been a particularly welcome development for her part time students who find it difficult to get to the library to access the paper copies. She has found that she gets more students impressing her with their knowledge of very recent legal developments, which they have gained through this type of research into primary sources, than students annoying her with overuse of poor quality secondary sources gained through inadequate search techniques.

She is not familiar with any JISC resources. She has found in general that there is quite a lot of material related to law, but is concerned that some sites aren't updated as often as the law changes, so she needs to scrutinize them carefully. This has meant that she does not place TOO much reliance on outside resources but prefers to write her own material, using external resources to test research/comprehension skills rather than to communicate content.

Emily is a little reluctant to encourage her students to search the internet to find resources to include in their coursework. She fears that they think searching means 'typing "law" into a Google search'. She prefers to recommend specific resources and databases particularly for primary law materials. For secondary materials she prefers them to go to the library and find journals etc (although an increasing number of these are now online).

In order to drive home to students the need to evaluate online resources carefully, Emily has co-designed with a colleague an exercise for some of our their Masters students. They have set up a WebCT exercise where students had to divide into groups and search different databases such as Westlaw, Butterworths Direct and Google, using the same search terms. Then they had to evaluate what they found according to criteria her colleague designed, and compare what they got. The results were eye opening for the students, and Emily is considering doing something similar for her undergraduate programmes, when she gets time to develop it.

4.1.7 Philosophy lecturer

Brian teaches Philosophy to undergraduates in the Sociology department. Brian is a keen web user and has developed online courses using plain web pages rather than a VLE. In the past he had a personal web page on the university server with links to resources of many kinds. Currently he links his students to texts, specialised dictionaries/ encyclopaedias, games, and interactive sites.

These are mainly resources which he has known about for some time, such as specialist search engines, but he also actively seeks out new resources from the web. He does not link his students to the library homepage, or to subject databases, saying that he has never found the library 'very relevant'.

Brian is familiar with JISC resources. He doesn't use them in his teaching but does recommend SOSIG and the RDN to his students as useful resource discovery tools. He can always find plenty of resources to choose from, and his problem is more a lack the time to put it all together!

He strongly encourages his students to seek out online resources for themselves, to include in and support their coursework. Brian feels that the skills his students use to evaluate what they find on the internet are no more or less than those they use to evaluate non-web materials.

4.1.8 Chemistry Lecturer

Karen teaches Chemistry. In the past Karen has not linked her students to online resources. When she first began to use WebCT she found that the WebCT site became very slow and unmanageable because of the sheer quantity of files she was having to upload and manage. So instead she has started to link to external online information resources to provide notes on specific topics.

Karen's strategy for finding suitable online resources is simple. She puts keywords into Search Engines, and then checks out the sites she finds. She has felt 'pretty isolated with respect to putting stuff like this together'. The only colleagues in her department who teach online are not working in the same areas, and are not able to give much support.

She does not link her students to the library homepage or to subject databases because they are all made aware of where to find these links as part of their library induction session, which is organised by her Department.

She has no knowledge of JISC resources, but does not find it too difficult on the whole to find suitable materials online for her Organic Chemistry courses. However, it can be difficult for the more specialised courses that she runs, such as medicinal chemistry, drug formulation and administration.

Karen's main concern in encouraging her students to search the internet to find resources is that this will result in plagiarism. Her students are told that the search engines are there, but in the past they haven't really been shown how to use them. However, this is something she is hoping to address as part of a basic level Information Management unit which she runs and which she is planning to make into

a self-paced on-line learning package. She is not confident that students have good website evaluation skills and often comes across instances of blind copying or downloading. However, she thinks this is also true of textbook material.

4.1.9 Chemistry and materials lecturer

Derek is a Chemistry and Materials lecturer. Derek links his students to a variety of online resources which he describes as 'Companion websites to texts'. He also directs them towards resources at other Universities, to HEFCE, and he provides an online link to the library. He is familiar with JISC resources and finds these useful. He has, for example, linked his students to the Virtual Training Suite.

His main strategy for finding suitable online resources is web searching and evaluating what he finds. It is not difficult for Derek to find suitable online resources because Chemistry is a very mature subject in this regard.

Derek encourages his students to search the internet for resources to include in their coursework, but was initially dismayed with assignment submissions that were clearly a 'mosaic' of lifts from various websites. To counteract this he has asked his students instead to build up a resources library of links to the best relevant sites. This does not get round the problem of critically evaluating the resources which students find. However, he believes this to be a transferable skill no matter what the application, and that what he sees now with the internet is just the same range of problems with critical evaluation that he was aware of before when using texts and literature sources.

4.1.10 Business and Management Lecturer

Paul teaches on business and management courses on one of the University's smaller sites. Paul is an enthusiastic user of online information resources and is keen to link his students to them. He ran an online statistics module from which he provided links to a US statistics course site which was similar to his own, but 'much more sophisticated'; to the Guardian on-line which he finds is a useful general resource for application led statistics work; to the Central Statistical Office for stats

data, though he did not find this resource particularly useful; and to a jokes site 'taking the Mick out of Economists' which he describes as 'light relief'. Paul noted that he had no feedback about the jokes, and wonders whether either his students never looked at them, or didn't think much of academic jokes!

Paul finds out about suitable online resources from such sources as 'things flagged in the Guardian on-line pages', or 'stuff mentioned by colleagues'. He describes himself as 'schizophrenic' about on-line resources. When he is seeking references and can trawl through SSCI, and other bibliographic resources, on-line journals etc. then he is very favorably inclined towards them. However when he is looking for data on X, or needs to find out more about Y and has to use a search engine, then he is exceedingly negative. He finds such searching time consuming and unproductive. Generally though he is satisfied that his information seeking strategies give him sufficient material for his needs. He does not link his students directly to the library, and had not realized that he could do this, nor is he aware of JISC resources.

He does encourage his students to search the internet to find resources to include in their coursework, but has identified their evaluation skills as a problem. He has had trouble getting them to distinguish between 'pukka material from (say) an Emerald journal, Amnesty Website, or similar, and stuff from chat rooms that they have picked up with one of their search engines', and this concerns him.

4.1.11 Education Lecturer

Rose is a lecturer in the Education Department. She has also been involved in Continuing Professional Development initiatives. Her vignette takes a different perspective on the online learning environment.

Although Rose trained to use WebCT, she found it difficult and far too time-consuming to be of practical use. She also thinks that online learning is not a cheap option. She did develop a module entitled 'How to write an essay', but did not link to any study skills or other relevant online sites, and has no real interest in using online resources.

Rose is interested in the idea of online communities, but had found that the ‘discussion group’ facility in her VLE had not been successful. She believes the online community is artificial and will not work well unless the common bond between members is very strong, as in the case, say, of a community of jazz enthusiasts. She does not believe communities of learners have this bond even though they are all learning. Her prior experience as an Open University student, when she and her fellow distance learners were expected to build up a community of distance learners, told her that learners were simply not interested in learning from each other. She had not wanted to discuss her work with anyone else, and didn’t think this was important to her learning experience. She had found that her fellow students had nothing in particular to offer her, nor could she help them.

Regarding students using the Internet to find resources for their academic work. Rose said that she had found them to be generally poor at evaluating what they find. They tend to “cram everything in and overshoot their word count, or they spend ages looking for stuff and waiting for stuff to get sent to them, and miss their deadline.” In her view there was an issue around how students should acquire these evaluation skills. Who should teach them? Where would the time come from to do this? She felt that tutors do not necessarily have the right skill set, nor do they always want to spend time acquiring it. She thought that skills training would not really be a part of their academic subject area, but an add-on for which they would not be paid.

4.1.12 Politics Lecturer

Steve again has a different perspective. He was not one of the VLE developers identified for the study, but another lecturer suggested he would make an interesting interviewee, simply because he does not use online resources in his teaching at all, nor does he teach online. His perspective is offered purely as a matter of interest.

Steve says there are ‘good reasons and bad reasons’ why he does not use online resources. The bad reasons are simply ignorance, laziness and other priorities, which stop him exploring properly the actual extent of resources in any depth. He does give his students websites, though he says even this is probably cheating a bit because he hasn’t actually explored these websites carefully himself, so they’re in effect a bad reason. Steve feels ‘a touch of shame’ that he hasn’t spent more time

looking at online things and it's certainly something he wants to do. He says he does not have 'a position' on the online environment; it's more a sense of 'horses for courses'.

Steve's 'good reasons' for not using online resources, are that he has actually looked through some websites related to his subject and has found that there's not a lot there. Also it is to do with the way he wants to teach his subject, which is to get students to read texts. In Steve's opinion reading texts online is hardly the same as reading books, and he feels strongly that he wants maintain what is a good habit for political philosophy students, that is reading books. He believes that some students don't read in the way that you or I might read a book, and what he wants to convey to them is that you do actually have to struggle with a text, particularly in political philosophy. He thinks that there's a view that if you can log on there is some kind of technological fix to solve your problem, whatever it happens to be. Steve needs to get his students to think, so it isn't a 'massive information gathering exercise' that they are involved in.

Steve admits that this is partly a rationalisation. It's not to say, he says, that there aren't online resources that could be useful and he knows of other politics lecturers who do use them. But he fears that there's always a danger within education that there's one educational fashion and then its superseded by another, rather than there being a real evaluation of any kind of technology and exactly what it could be used for. 'So in a sense for me' he says, 'the jury's still out on the extent to which it's useful for my subject'.

Steve does recognise the value of students developing transferable skills, and he is not against this. He also acknowledges that if students come to expect such resources to be available, then he will provide them. If one of his peers told him about a 'wonderful political philosophy website' he would be interested to have a look at it. However, for him the prime resource is books, because political philosophy is a difficult subject, which he says is 'not just about acknowledging a position, it's about being able to string together coherent arguments'.

Steve also believes that 'surfing the internet' is time-consuming, and that students don't always have time to do this. He suspects that they regard it as a fun activity rather than using it as a serious tool. Because of this he suggests that it may be more appropriate for postgraduate work, where the student has more understanding of and enthusiasm for such a difficult subject. He gives the hypothetical example of an undergraduate needing to do an essay on Locke, who might find a Locke website with 'some interesting things about his life, or a raging debate or argument on some aspect of his thought', and suggests that the problem would be that most students wouldn't be intellectually able to enter into the debate.

Steve also has a view on online journals. Many of these he feels are full of articles that people have failed to get into paper journals. The journal articles which he uses and gives to his students are paper based, and again he comes back to the point that students need to 'struggle with a text' in his subject area

Steve takes up the idea of a course website with some enthusiasm. He can see lots of good reasons for having one, such as having all the course information on the website. He has no knowledge at all about WebCT or teaching online, and quickly latches on to the idea of a discussion group within a VLE. He says he would be very much in favour of that as a tool for learning and thinks it could be a very good thing. However, he says that at this moment in time, he doesn't really have the need, and doesn't feel any inadequacy because he does not use online environments. 'If its not broke don't fix it' he says.

4.2 Phase II vignettes

4.2.1 Languages Researcher

John is a PhD student coming up to the end of his first year in the Languages department. His topic of research is 'Metafiction and Cinema', focusing on Spanish film. Today he is continuing to look for information on his topic in much the same way as he has been researching from the start.

He sat at his computer – he usually starts by checking the websites he has bookmarked, which contain relevant information and articles. When he first began searching for information on his research topic, he used Google as his first port of call and built up a list of favourite sites from the results he got using the terms ‘metafiction’, ‘metafilm’ and ‘metacinema’. John isn’t sure why he prefers Google to other search engines – it was recommended to him as an undergraduate, he tried it and found he preferred it to both Yahoo and Alta Vista, which he had also tried. He knows he liked the fact that there were fewer adverts, and that it seems “simple and easy to use”. He has it bookmarked, and “often goes straight to it whatever he’s looking for”. He also uses Spanish search engines that he’s aware of through past experience, as these can bring up Spanish language websites on cinema and film releases that he wouldn’t get from Google.

However, John also believes that “sometimes, only a book will do”. Therefore, he also utilized the library website, doing a keyword search on their online catalogue on ‘metafiction’ and looking at the whole list of results. He came to a decision there and then about which looked most relevant, made a note of their titles and class number, and set out to the library. When he got there he also browsed the shelves around the class numbers he’d noted in case there were books on the subject which didn’t happen to have ‘metafiction’ in the title. Once he’d taken out the books he wanted he used the bibliographies in these books to get further references.

He then went back to the library website to look at the electronic journals and electronic databases listed there. He wasn’t sure if he wasn’t limiting himself unduly by sticking to these resources, but decided that the benefits of guaranteed access and the probability that the information would be reliable outweighed the fact that he might not be checking every possible resource. He found lots of relevant articles amongst the journals, and enjoyed the fact that he could access them instantly and either print them off or save them to his hard drive, without having to leave his desk: “Searching amongst the printed journals collections in the library and then having to photocopy the articles adds a lot of time and work to the research process – not to mention cost of photocopying!” Obviously, though, the collections of journals held in the library are still very useful, as not all journals have all past issues online. For example, if he’s looking for articles from, say, the 1970’s, he’s pretty much resigned to having to go to the library and do it manually.

After doing all this, John felt he had quite a good, comprehensive collection of articles, books and websites. He was aware, however, that this sort of research was an “ongoing process”, so made sure to bookmark websites and online journals in order to regularly return to them to keep up to date with current information. He also set up email alerts with four of the websites, as well as checking printed versions of new journals in the library every so often.

Coming back to the present, then, as John sits in front of his computer this morning deciding what to do first, he would say that he “generally feels quite successful” in his searches for information, although “it’s difficult to measure, because it’s an ongoing process. That’s why the internet is so convenient, because I can have access at any time of day or night, which obviously you can’t do with the library”. However, there are still one or two items which John hasn’t yet got and believes will be really helpful. One of these, an American book not held by the libraries he’s tried, or stocked by the bookshops, has been on order for the past two months and is still awaited. The other is an article which he is desperate to get hold as it looks very relevant to his work, and he decides to have another try today. The journal is published in America and doesn’t appear to be held in any of the libraries he uses – nor does the university have access to it online. He has submitted an Inter-Library Loan, but has been warned that it could take some time. Today he decides to try the internet.

He goes straight to Google and this time, instead of the journal name, tries typing in the name of the author. He checks the results list and sees an American university site, which he clicks on. He recognises the name of the author and clicks a link to his page, where there is a link which takes him to a discussion paper published on the website. Reading it he realises that, happily, it is the same paper he has been looking for in pre-publication form. He prints it off, feeling very well satisfied with his efforts, as it hasn’t taken any longer than ten minutes. He smiles and reflects on the fact that “at one time, when he hadn’t felt confident about using the internet, not being able to get hold of the journal at the library might have made him give up.” Now he “relies almost entirely on the internet”.

4.2.2 English lecturer

Mary is a lecturer in the English department, and has been for some time. She has also published more than one work of fiction, as well as producing academic research papers. Her information needs can therefore be very varied, depending on what she's working on at the time.

Today she is looking for a particular recently published novel which may have some bearing on at least one of her taught units, and also wants to find some reviews of the same book. Mary "always goes to the internet first" when looking for anything, and this time is no exception. However, Google search engine is usually her first port of call, whereas in this instance Amazon seems more appropriate as she knows the title and author of the book she is looking for. Amazon also often has reader reviews which, although Mary wouldn't rely on the information they contain, were often quite interesting and would give her a feel for the book.

After locating the book easily on Amazon, reading through some of the reviews, and also noting which other books Amazon has categorised it with, Mary turns to Google. She enters the title of the book as a phrase along with the name of the author, and is pleased to note that the results include interviews with the author and other reviews of the author, as well as reviews of this particular book. The New York Times Review and the Times Editorial Supplement are also listed amongst the results and she clicks on these – she would have consulted these websites anyway, had they not come up amongst the results.

Mary likes using Google because she feels that it is easy, fast and comprehensive. She heard of it by word of mouth a few years ago, and was "pleasantly surprised to find that she could locate things on there that were academic". However, she usually complements the information she finds on Google by visiting the specialist academic resources available on the internet, such as the arts and humanities database, Humbul: "This narrows the field down. If I type in certain keywords in a specialised area, I know I'm not going to get irrelevant commercial websites coming up. Also I know that they've been vetted and have more academic credence".

Mary believes that the internet has “transformed her life”, particularly when it comes to undertaking research: “You have instant access to information all over the world. I can check out card catalogues in the States or anywhere without having to actually go there, so I can plan my time and research better – and it’s free...certainly, you’re able to do a much better job of research.”

On this occasion, after locating the book she needed and printing the relevant reviews, Mary decides to do some browsing, as she has nearly completed a piece of research for publication and wants to be sure there’s nothing she’s missed. There are certain journals she regularly consults online, in fact, that’s a “primary area – they’ve been vetted by colleagues”. She also goes to a subject portal and browses through the relevant links: “that’s quite good to find out what’s going on”. Finally, she turns again to Google and enters some keywords to check whether it brings up any information on recent conferences in the results, “as it often does...although it’s ‘quick and dirty’ it’s very very useful”. Mary feels that this type of browsing on the internet is “fundamental to her work”. Although it’s time-consuming, she doesn’t find it difficult. She believes that all research is “like being a detective...you’re going down this trail which might lead to one thing, but might also lead somewhere else and somewhere else. Doing any sort of research I have to set time periods...after about an hour online I get fed up and have to stop. But I couldn’t manage without it now.”

4.2.3 History student

Amy is in the 3rd year of her History undergraduate degree. She first started using the internet when she started her degree, and has found it has taken her some time to get to the stage where it’s “really useful”, but now feels quite confident and finds using the internet “easy and quick”.

Amy has exams coming up soon and has begun to collect resources for revision purposes. She has an exam on ‘Counter-tradition and History of the Occult’ and has decided for this to answer a question on the Apocalypse. To find information in this topic area she begins with the reading list issued by the lecturer and checks the titles on the online Library catalogue. Unfortunately, most of them are out on loan, although there are one or two available which look relevant. She travels to the library to get these books and, whilst there, browses the shelves in the same class number,

but can't find any more. She concludes that they must have been borrowed by her fellow-students revising for the same exam, and begins to feel a little worried.

She decides to go back to the OPAC while still in the library and try a keyword search on 'apocalypse'. Luckily, more books come up in the results which, although they belong to other departments (such as the Art department), look as though they might be relevant. She goes to look at these, and finds that some do have some relevant information, although the coverage might not be quite as comprehensive as she could have wished. But, "better than nothing". She borrows these books.

Her next step is to try the internet. She goes first to Google, which she has used since somebody recommended it to her in her first year. She finds it easy to use, likes the layout, and also likes the fact that if you're really stuck, you can go to the 'Questions Page' where you can type in a question and a researcher will try to answer it for you. However, she doesn't find herself having to use this option very often.

This time she simply enters 'apocalypse' into the search box and finds some relevant websites, which have some more current information than the books she's borrowed. Some of the sites, however, don't look very reliable, so she wouldn't trust the information from these. She completed a module in her second year which taught students how to evaluate websites: "I look at things like the web address – does it end in .ac or .gov, for example – and the author's name, the authority, links to other sites, etc.". For example, on one of the sites that Amy's looking at, there is a link to a site called 'My Boss is a Tyrant'. Feeling curious, she clicks on it to find a site filled with people just having rants about their bosses. She can't understand why this might be related to a site with information on the apocalypse, and decides that this "casts serious doubt on the reliability of the information".

Amy feels "to a certain extent" satisfied with the information she's collected from the books and websites, but is a little worried about not having more of the books from the set reading list. She goes home and talks to her flatmate from the same degree course and discovers that she has recently completed a unit on the subject of apocalypse. Amy is glad to hear that her flatmate still has some of the books from the

reading list and arranges to borrow them, feeling very fortunate indeed. She retires to begin her revision feeling much more confident about her resources.

4.2.4 Politics Lecturer

Professor Bill Smith is a lecturer in Politics. His work covers a variety of topics, some of which are very contemporary and some of which are more historical. For this reason, he not only uses traditional library resources, but now includes the internet as a very important resource. He has been using the internet for his work for approximately two and a half years, and now estimates that he uses it everyday.

Today Bill logs on to the internet, and as is his routine, checks for any developments in the political situation in Northern Ireland. This is one of the contemporary courses he teaches, and is one of the main reasons that the internet has become so essential to him, as “it changes so fast that the standard texts are literally rendered irrelevant...or certainly less relevant...by events that happen all the time. Therefore it’s really critical for me to be able to get hold of material like this quickly.” In order to do this, he uses the Cain website, which is a Northern Ireland website, and also regularly checks newspaper sites and the BBC. Another course for which he needs very current information is a contemporary British politics course, and he has a particular website he uses to keep up to date with this area. This is called ‘Working for an MP’, and contains lots of links to other sites which he has got into the habit of using.

Bill also teaches more historical courses, such as British Political Development, and for this he “doesn’t really use the internet a great deal...it’s just not as important”. He does have something he needs to look at for this course today, so when he has finished on the internet, he will go to the library to use their collections of Hansards. This won’t be the nearest university library, which is only next door, but a library which is much further away. However, he prefers to use this library, as he has been using it a long time. He knows what their collections are, where they are, and has “just got used to using them there”. He knows that Hansards can be accessed online, but has grown accustomed to using the hard copies, and feels more comfortable doing this. He does use other libraries, though, depending on what he is looking for.

His previous experience tells him which libraries tend to have the better collections of different materials and types of resources.

After checking his usual websites, he decides to go to Google, as he wants some information on GM crops and the state of governmental and parliamentary thinking at the moment. Google is the search engine he always uses – he hasn't even tried any others. When he first started using the internet he “didn't have a clue”, and Google was actually recommended to him by his children, and reinforced by the fact that colleagues in the department often asked him if he used it. He thinks “it's just the best”, and hasn't ever had a query where he's been disappointed with the results: “I always think it's really good”. He likes that it's simple and quick: “I'm not very sophisticated at this kind of stuff, and I can go to Google, put in a few key words, and bang! it all comes up.”

To find the information he needed, he enters “GM crops” as a phrase, and limits the search by date, so it would only bring up recent information. There are lots of newspaper articles which give him the information he needs, as he's looking for “what the basic state of the argument is, politically”. If in the future he decides he needs more, he would begin to put enter terms such as ‘BMA’ and ‘Greenpeace’ into Google, but for now, he is satisfied.

When using the internet for political information, Bill is aware that it's important to evaluate it carefully, as sites of political parties may well be official, but have to be read “with an eye to potential bias...they've got particular perspectives. And you do come across sites of fanatics, quirky ones, and you just make a judgement.”

4.2.5 Politics student

Julie is a 2nd year student of Politics. She has an essay to write for her course on the subject of election costs – looking at why political parties in the UK use newspapers much more than they do television airtime when it comes to election propaganda. She started by looking on the Internet, using the Google search engine, as there was nothing in her reading list for the course that looked particularly useful. She believes that with Google, “you get more relevant results in an understandable order”. She

found several websites about elections, but can't seem to find the information she needs to answer the question.

She decides to see her lecturer. He has given her lots of good advice in the past, particularly when it comes to searching on the Internet. For instance, in her first year, she didn't realise that a lot of the websites she was using for political information were American sites, which obviously made quite a difference to the information she was gathering. Her lecturer emailed to advise her about this, adding that in some subjects, the origin of the website might not matter so much, but in Politics it can severely affect the slant taken. Despite these mistakes, she has come to realise that "in Politics, using the Internet is essential" for current information. She has had coursework questions set which ask about "up to 2003", and even the most recent of books will only contain information up to about 1998 or 1999, whereas on the Internet, particularly certain sites recommended by lecturers, you can get absolutely up to date information. However, she is also aware that websites "can be written by anyone with an opinion" and that you have to be sure it's reliable before you use it. Also, in Politics, you have to be aware of bias, so Julie tends to make a note of the author of the information and do some research to "discover their political viewpoint and possible motivations for writing something the way they have."

On this occasion, her lecturer advises her to think about other avenues of information first, and mentions 'primary sources'. He obviously doesn't want to just tell her the answer, and she goes away feeling a little mystified. She then goes to one of her fellow-students, Mark for advice. Mark is a mature student, and she has noticed how the mature students on her course seem to be "more proactive" when it comes to looking for information (for instance, she knows that Mark is on the mailing list of the EU in Brussels, and also keeps in regularly contact with various MPs' offices around the Northwest, so receives regular information from the 3 main parties). They "think ahead more, and that makes the younger students think ahead too". Lots of the younger students go to the mature students for help, and the mature students seem happy to guide them if they can.

Mark tells her that he has written to the BBC and to the Press Complaints office, who have told him to go to a certain website which contains the information. He gives her the address for the website, and she goes to have a look. Sure enough, it contains

comprehensive information on the subject, and answers all her questions completely. She feels extremely pleased, and begins her coursework with confidence.

4.2.6 Economics lecturer and researcher

Carl is a lecturer and researcher in the department of Economics. He estimates that he uses the internet everyday as part of his work, and finds it particularly useful, not just for conducting research, but also for maintaining contact with students.

It is near the end of the academic year, and students should hopefully be starting their revision for exams. Today Carl is uploading all his lecture notes onto the internet, where they'll be accessible via the departmental webpage. He does this every year, feeling it a good revision tool, especially for students who may have returned home when the term ended: "the students can log on and revise; they don't have to be in Manchester, they can revise from wherever they are". He believes that the internet is a "quicker way of getting in touch" not only with students – for example, he was pleased when recently, in order to change the proofs of a paper he was having published, he was able to download from the publisher's website instead of it being posted. This meant he was able to make whatever changes he wanted, print them off, and fax them back very easily and quickly.

Carl much prefers being able to access information on the internet than having to go to the library for it: "...not that I've got anything against the library, but the material held there isn't as up to date as stuff you can get hold of on the internet". He finds the internet more convenient, and a faster way of searching: "sometimes you have a phrase in your mind and think 'where did I hear that?', and to try to find out without the internet would take forever...but you just go to Google and type it in, and nine times out of ten it comes up". Carl thinks that, possibly, searching on the Internet is made easier by the fact that within Economics, the information he's looking for is often very factual or statistical data, which, once experience has taught you where to go, is very easy to find and access. However, Carl does make use of the library when looking for early journal articles that aren't available on the internet, and when using textbooks.

Carl tends to use Google to search with, as it's fast and "there are far too many advertisements on the others". Plus he likes the fact that you can restrict your search to pages from the UK only, so "you don't have to wade through heaps of American rubbish".

Carl also has useful sites bookmarked that he uses regularly – for example MIMAS, which contains a lot of useful statistical data. His research focus is about Greek economies, so he also has some Greek websites bookmarked. He finds the subject librarian very useful, as she sends him regular emails pointing him in the direction of "useful stuff". Plus he uses links from the library and departmental websites, and the Learning and Teaching Support Network as well.

After uploading his lecture notes, Carl decides to look for some statistical information he's been wanting. He goes straight to the MIMAS site via his bookmarks, "flicks through a few things" until he gets what he wants and downloads it. This comes very easy to him, but he finds it harder when looking for statistical data relating to Greek economies. He's found that the data isn't yet as accessible from Greek websites as it is from British websites, and often has to physically go and visit the library or the statistics office. Also, he has several email alerts from academic journals on the internet, but as yet can't set up a similar thing with his favourite Greek websites, as they are "not so sophisticated yet". However "in the future I'm sure they will set up these alerts, and this will be even more convenient than having to check them everyday".

4.1.1 Sociology student

Emily is a third year undergraduate studying Sociology. She had used the internet before she started her degree course, but thinks it still took her a while to learn how to search effectively for academic information. Today she is searching for information on her dissertation topic, which she hasn't been working on for long. It's about travel and risk.

When looking for information for her coursework, Emily usually starts by going to her set reading lists or lecture notes and checking the library OPAC for the books there.

This time however, not having a reading list made her a little unsure, and she asked her supervisor for help starting out. He has pointed her towards a couple of seminal articles and a website called the Lonely Planet website, which although not really an academic website, has some good information about travel, and some useful links.

She has one of the articles her lecturer recommended, and has several references to look up. She goes to the library website. This is her usual starting point, even if she isn't looking for books on the OPAC, because it also gives links to electronic journals and databases. However, she does usually start with books at first, because "when you're just looking for a topic, for an overall view of something, books are the best place to start." She checks the references on the OPAC, and finds that there is a book in the All Saints library that looks useful. She makes a note of the classmark, and then undertakes a keyword search on the OPAC, looking for more books. She does this by entering the word 'risk' and looking at all the titles in the list of results – although she knows this is a little time-consuming, she thinks it is one of the easiest ways of searching. She spots three more books which look useful and again notes the classmark.

She decides that before she sets out to the library, she may as well search the internet for more articles or information. She goes to the Lonely Planet website, looks through that, and then goes to the links and starts to trawl through other travel websites. There doesn't appear to be much on her topic, so she goes back to the library website and follows a link from there to the electronic journals (JSTOR). She also has her own account on the Sociological Abstracts database, and checks this using a keyword search.

Eventually she finds an article in an electronic journal which looks very relevant. However, she doesn't feel very happy because it's taken so long, and "one article, no matter how good it is, isn't very much". She decides to go to the library to pick up the books she's seen, but then remembers before she leaves that she has some more work to do for a presentation coming up in a few days.

The presentation is on Auschwitz and Hitler and his regime. She started it quite a while ago, making books from the library her main source of information – she tends

to trust the information in books more than that from the internet – but in fact, found she had at one point taken too many books and was a bit bewildered about which to use. She had to sift through them to get the relevant information, which took some time but eventually got done. Now the presentation was written, but Emily wanted some visual images to back it up and make it more interesting. She had decided to try to get these from the internet, and she thought it would be easier to download them than to photocopy them, and that they'd be easier to display if in electronic format. She felt she didn't need to worry so much about reliability of information when it came to photographs, maps, etc., which were what she wanted.

Emily knows from previous experience that there's an overwhelming amount of information available about Hitler and the holocaust, whether electronic or printed. She goes to Yahoo and instead of searching by keyword, follows the links through to history, then 2nd World War, then Holocaust. As predicted, there are a lot of websites, but she chooses the one which "looks most official" and looks through it. This has lots of visual resources – a video, lots of pictures, newspaper articles, etc. and she decides to stick with these.

After she's finished on the internet, Emily heads off to the library to pick up the books she found earlier – it's not far to walk. When she goes to the shelves where the books are listed as being held, she finds that two of them aren't there. She goes over to the computers and checks the OPAC again – no, the books should definitely be there. One of them should have two copies that are not on loan, according to the OPAC. She checks the shelves again, but can't see either of them. She heaves a sigh – this has happened before. She goes to speak to the librarian, who is nice, but can't really help. She suggests Emily check the place books are kept before being reshelfed, which Emily does, but still can't find either of the books. This means that Emily has so far only got two articles and two books on her topic, which isn't really enough.

She goes back to the shelves where the other books were and browses around. She does this normally anyway, "because the keyword search doesn't always bring up everything you want, and you might come across something interesting that you're not expecting...sometimes too you find things in a way that isn't obvious...you kind of stumble across them and think 'Oh, why didn't I think of that before?'". Because she's

experienced this before, Emily will keep looking, even if she doesn't find anything more today. She'll go back to the internet and try again, and come back to these shelves to browse again, just in case some books get put back that aren't here right now. She has two books and two articles, which will do as a starting point.

4.2 Quantitative results

The following section presents quantitative results from Phase II of the research. It is evident both from the interview transcripts and the vignettes themselves that a number of themes began to emerge from the answers and comments of the participants, and these are discussed below.

4.2.1 Success in searching

All nineteen of the participants said they thought they were generally successful when searching for information. Eleven went on to add that it might take quite a lot of time, while eight (including four undergraduates) commented that research is an "ongoing process", and so success from search to search is difficult to measure. However, most then added that they usually felt quite satisfied with what they found. Comments included:

- “It sometimes takes quite a while to wade through pages of irrelevancy to get there, but by and large I think I’m generally successful...”
- “I generally feel quite satisfied, even though it’s taken some time.”
- “I put quite a lot of time into it, it’s ongoing.” and
- “I do spend quite a lot of time [looking for information], because it’s part of my job, but success every time is difficult to measure, because it’s an ongoing process.”

4.3.2 Most regularly-used information resource

13 of the 19 academics interviewed indicated that the Internet would be their first choice of resource when looking for information. The 6 who didn't were all undergraduates who stated that they would first go to their reading lists for that unit, or to lecturers.

It is worth noting that all those who stated they would use the internet first added that they would then follow up by going to the library, while those undergraduates who would go first to lecturers or reading lists would go to the library, but after checking the library OPAC from their location first. In fact a large majority of participants (14 out of 19) stated that they would check the OPAC online from wherever they are at the time before physically setting out to the library:

- “Well, in a way you still start online, don’t you? I mean, you’d use the online catalogue...searching in different ways...narrowing the range, or, if it’s too narrow, broadening it”
- “I use a keyword search, because I find the OPAC is very sensitive when it comes to an author search...you have to type it in exactly, or it will say it doesn’t recognise the name and it can be frustrating – particularly when you know they should have that book.”

When it came to choice of library, 18 of the 19 participants said they would go to the university library first, which is located close by. When asked why, most people commented on its convenient location rather than on other factors such as the collections held, etc. (although some followed up other reasons):

- “I check the OPAC for all 5 Manchester libraries first, starting with the John Rylands library because it tends to have a better collection. But I use All Saints most often, because it’s nearer.”
- “All Saints library is the closest, and the librarians are pretty good. I often go to them for help if I don’t know what I’m looking for.”
- “I like it [All Saints] because I’m based here, it’s convenient, easy access and everything...and it’s got so many resources.”
- “I check on the OPAC at home and if it’s at another library, I’ll order it for collection at All Saints, and go to pick it up when I know it’s there at the counter.”
- “All Saints is close, so it’s convenient.”

The only participant who didn't name All Saints as his first choice was a lecturer who has been using the John Rylands library (another university library, further away) for many years. He uses various collections, abstracts and indexes: "They no doubt have them in our library, but I've just got used to using them there. I tend to go there because I know where they are...you can just sit next to them while you work...but I also use our library [All Saints] for journals, stuff like that."

Other participants mentioned "knowing your way around" as motivation for using All Saints most often. One participant confessed, laughing, that she was sure Central library (the main Manchester public library) held good material, but "it's so big and scary and I can't find my way round. I always end up asking someone and feeling like a fool because I couldn't find it myself."

4.3.3 Using the internet – problems and benefits

The majority of respondents stated that when looking for information, they would turn first to the internet, even if only to check the online library catalogue for books. In an attempt to understand why, participants were asked what they thought were the 'advantages and disadvantages' of the internet are. Comments included:

- "I like it because it's quick and it's easy. Sometimes narrowing it down can be difficult...when you're looking for a specific thing and you type in a keyword and come up with, like, a million responses."
- "The accessibility of data's quite good...the material held in the library just isn't as up-to-date as stuff that you can get hold of on the internet."
- "Speed and convenience...being able to just download the information...but you can't always guarantee the reliability of the information."
- "You can find things a lot more quickly than if you had nowhere to start from. It saves on phone calls and saves on trips out as well. But sometimes it is nice to talk to someone face to face, particularly in an expert field...chat rooms on the internet are never the same."
- "The amount of information is both an advantage and a disadvantage. You can find some wonderful stuff, but have to wade through lots and lots to find it."

- “Instant information on anything I need, and also the fact that I can download it and therefore use it in class directly...”
- “I use the internet because I’m lazy (laughs), because I don’t want to have to get up and go to the library and you know if you find the article on the internet you can just print it straight off instead of having to search through journal issues and photocopy them.”
- “I can do a lot of preliminary research before I go anywhere, making sure if somewhere has a collection that it’s of potential interest. Planning...you’re able to do a much better job of research.”
- “I can search in my underwear!”

As many of the responses were very similar they have been categorised and labelled as follows:

| Advantages | Number of responses (total = 40) | Disadvantages | Number of responses (total = 29) |
|--------------------------------------|-------------------------------------|-------------------------|-------------------------------------|
| Speed/time-saving | 14 | Reliability of info. | 8 |
| Ease of use | 6 | Too much info. | 6 |
| Convenience | 8 | Irrelevancies | 7 |
| Accessibility / coverage of material | 7 | Technical issues | 5 |
| Currency | 3 | Can’t access older info | 2 |
| Costs/saving | 1 | No face-to-face contact | 1 |
| Presentation & navigation | 1 | | |

Table 1 Quantitative responses

The number of positive comments on the internet outweighed the negative comments.

4.2.4 Preference for Google

When asked their favourite starting point if searching online, the majority's first choice was Google. Of the four lecturers, three preferred Google as their starting point, while one used Yahoo. Of the five researchers, two went to Google first, two to the Library website, and one to Ask Jeeves. Five of the ten undergraduates stated Google was their first choice, two used the BBC website, one went to newspaper sites "such as the Observer or Guardian sites first", and two weren't sure what their first choice would be. So, in all, ten of the nineteen participants would go straight to Google if looking for information on the internet.

When asked their favourite starting point if searching manually, 100% of participants stated that they would begin in the library. Almost all of these added that this would be the university library, which is close to the faculty. Only one (a lecturer) replied that he would use a different library which is further away.

As such a sizeable majority said they use Google as their first choice when searching, and as of the nine people who mentioned other starting points, three said they might then go on to use Google, it seems appropriate to look at the reasons given.

When asked 'Why Google?' some participants seemed to find it difficult to articulate their reasons. Comments included:

- "Because I think it's just the best"
- "It's just what I'm used to"
- "Google seems to be the one that people in my area seem to use" and
- "I have no idea. Someone recommended it, I tried it, and it worked."

However, after some probing, most seemed to agree that it was easy to use, quick, and brought up relevant results. Some also pointed out its simplicity and lack of advertisements as an advantage.

- "It's easy...you don't have to think too much about your keywords. Laziness..? (laughs)"

- “It’s quick, it’s easy...it’s comprehensive...amazingly enough, you can find things on there that are academic.”
- “I tried Google, Yahoo and Alta Vista, and liked the fact that Google is simpler and has fewer adverts...”
- “It just seems to be more intuitive than others.”
- “There are too many advertisements on the others...Google’s fast, you don’t have to wait for all the pretty pictures to come up”.

Also mentioned (by 4 participants) was that with Google.co.uk you can restrict your search to UK pages only – it would appear that people like this feature “it saves time. You don’t have to wade through heaps of American rubbish.”

4.2.5 Quality issues

Every participant was aware that there could be problems with the quality of the information you might find on the internet, and almost everyone brought it up before the question was even asked during the interview, usually as a disadvantage of the internet or a reason for using certain websites and online collections:

- “Problems are the reliability...I need to be absolutely confident that I can trust the information, so I tend to concentrate on certain sites that I know and feel confident about.”
- “...one of the problems with the internet is that you can have, say, eighteen year old Joe college student writing on a topic and they’re not necessarily in a position to comment. So on these sites [specialist resource guides] I know they’ve been vetted and have more academic credence.”
- “I don’t really use the internet except as an initial resource...I’ve taken information from the internet in the past that hasn’t been true.”
- “One of the problems is the reliability of information...I tend to use Google advanced search and restrict the search to within certain domains – for example, .ac or .edu.”
- “It will give you a fact and then not tell you where it’s from.”

All participants had ways of judging whether something was of good enough quality or reliable enough to use, and many were very similar. 18 of the 19 participants mentioned ‘authority’ – of the author or of the organisation, and the majority said either that they would look at the web address, or check the sort of organisation by going to the home page, or else stick to using information from certain sites that they know by previous experience they can trust. Most participants said they thought it was easy or fairly easy to judge.

- “The first thing I look for is the ending of the web address – for example, is it ac.uk or .edu?”
- “You can try to find the author’s name, other work they have published. I find it quite easy...making comparisons helps.”
- “The ones I’m looking at are mostly government websites and things like that, and I just assume they’re good...but obviously if it’s not relevant it’s not useful.”
- “I suppose I target certain sites if I’m interested in certain aspects of things and I know that the sites are good at that kind of thing.”
- “I look and see if it comes from a university...if there’s an organisation, generally, or if you know the person, those sorts of things. It’s the same way you evaluate any resource source. That’s why we have refereed journals...there are becoming more and more online journals that are refereed and vetted.”

5 Discussion and conclusions

5.1 Phase I

The focus of this Phase was to help build up an awareness of how online information resources, (including those funded by JISC,) are surfacing in Higher Education institutions. How are lecturers finding out about them? What kinds of online information resources are they using? How are they presenting them to their students? While it is known that such resources are being provided and managed within the context of the College or University Library, where the librarian acts as a resource filter and quality evaluator, it is also apparent that they are increasingly emerging in non-library environments. Indeed it is apparent that while lecturers value certain library services, the library and librarians do not play a major part in the resource discovery process.

With the exception of Rose and Steve, all of those interviewed for the study were keen to provide links to online resources for their students, to a greater or lesser degree. They saw this as a way of providing a wealth of newly available and useful material to enrich the learning experience. Access to very current and dynamic online data such as news agencies and recent legislation, and to primary data resources such as historical maps, photographs, speeches and press statements were singled out as being particularly helpful to students. How lecturers themselves discovered resources was revealing, with none seeking help from library staff for this activity. Most conducted web searches using a popular search engine such as Google or AltaVista, some remarking that they particularly enjoyed this activity, or they asked colleagues to recommend sites. Other strategies included following up links found in professional journals, conference papers, or from conversations in meetings. Newspapers were another useful resource, especially the Guardian, and one lecturer had had sites recommended by her Mum – and indeed, why not!

Although there was no doubting the enthusiasm of lecturers to incorporate online information resources into their teaching modules, a pattern of common problems soon emerged. Foremost among these was their own lack of understanding of how to manage web sites. For example the complaint about a crucial website ‘disappearing’ and disrupting the teaching process is significant, but more so because the lecturer in question lacked the skills and knowledge to preserve the

resource. She did however have a vague idea that library staff might be able to 'manage' such materials for her, though she had not approached them for help. At the same time, 'vanishing websites' had helped make a point about the realities of modern warfare.

Another serious concern was the effect of promoting online information resources as suitable academic material. Most of the lecturers questioned had encouraged their students to seek out online resources to include in their coursework, yet many had reservations about the results. Two problems were highlighted. Firstly the overabundance of online material in certain subject areas meant that students could become overwhelmed by the sheer amount of information available to them with little effort. Lecturers had identified a 'new pressure' on some students who spent so long filtering and assessing online material just in case they overlooked something important, that they were missing deadlines or leaving insufficient time for thinking and writing.

A further problem was students' poor information evaluation skills. This manifested itself as an inability to distinguish between the quality as an academic resource of, say, a search engine and a subject gateway, or the website of a professional body and a commercial enterprise. One lecturer even reported a student giving equal weight to material from an Emerald journal and from a chat room. Whether this was a new phenomenon related particularly to 'internet material', or whether it was simply no different from the problem students have always encountered when evaluating traditional book and journal material was disputed. Some lecturers felt this was nothing new though others reported a marked difference between how even very able students evaluate paper based and online resources. The answer to this particular problem clearly lies in skills training, though opinion was divided on who should deliver this to students and where the time was to come from to do so. Only one lecturer admitted to lacking both the skills to deliver what the student needed and the motivation to acquire them, while several assumed that a library induction session (which lecturers often do not attend) provided sufficient skills training for the rest of the student's career.

5.2 Phase II

This Phase of the research involved participation of academics, researchers and students working across a variety of disciplines and academic status. Every participant used the Internet regularly to find information related to his or her academic work, although one undergraduate did state that she used it only as an initial resource, because she “didn’t trust it”. This mistrust is reflected by fact that the most common disadvantage of the Internet was reliability of information.

Participants made many more positive comments about the Internet than negative, with speed being the most common advantage mentioned (followed by convenience, accessibility of information and ease of use). The fact that speed appeared to be uppermost in participants’ minds ties in with a result found in a previous EDNER user study, where speed was shown to be one of students’ most important considerations when evaluating a service (Griffiths and Brophy, 2002)

The majority of those interviewed prefer Google as their starting point on the Internet. In Griffiths and Brophy (2002), Google was found to be the search engine of choice for 45% of students, and this preference is referred to as the “Googling phenomenon” (page 11). Among the reasons given by interviewees for this preference were ease of use, familiarity, recommendation from family and colleagues, fewer adverts, etc. Only 4 out of the 10 people who gave reasons for preferring Google mentioned ‘good results’. This again relates to the previous study by Griffiths and Brophy (2002) that found that users may rate ease of use and user friendliness at least as highly (if not more) than Performance.

Convenience and familiarity were often mentioned by participants as reasons for usually using the university library (which is the nearest). Only one participant (a lecturer) used another library, further away, most often, and again, gave “it’s just what I’m used to” as the reason. (Familiarity was also a reason people gave for their preference for Google.) Also, most checked the OPAC to make sure the resources were there before actually setting out. This perhaps ties in with a finding in Stephens (1998), a diary study looking a distance students’ library use – they were described as “feeling pleasure and relief when saving unnecessary and wasted journeys” (p.140) when checking ahead with a library by phone.

5.3 Conclusion

Although there were many similarities in information seeking behaviour regardless of academic status (i.e. whether lecturer, researcher or undergraduate), some interesting differences were recorded. For example, while both lecturers and researchers routinely check bookmarked websites and new journal issues for new articles or information, and many have set up email alerts, most undergraduates stated that they never do this. One, a third year who had just finished her final exams, said “I realise now I should have done – but it’s too late, isn’t it?” Only one student interviewed (a first year Politics student) made any attempt keep abreast of what’s going on in his area – he had joined mailing lists, and made contact with the offices of local MPs – and he was a mature student. It was commented by other students from different disciplines that “mature students seem to think ahead more, whereas we just go with the flow” and that “quite a lot of mature students tend to guide the younger students, tell them where to go for information”. From the comments made by the undergraduates, and the examples given by them of an information need, it would appear that they only seek information when it’s specifically needed for a piece of coursework or exam revision. It could be argued that whereas the lecturers and researchers are aware that they need to be proactive in their information seeking, the undergraduates tend to react only when absolutely necessary for course requirements.

A second difference is the way in which the students rely heavily on reading lists or lecturers as a first source of information, for example, as one student said, “Lecturers will tell you where to go, and it saves legwork...”. This contrasts with their assessment of themselves as successful in finding information, and their belief that they can easily distinguish between poor and good quality information on the Internet. All participants indicated that although looking for information could take time, they were usually satisfied with the results, whether using printed or electronic information.

From the participants of this study there appeared to be little differences between lecturers’ and researchers’ information seeking behaviour, although their information

needs are somewhat different, for example, all the lecturers mentioned looking for material to be used in lectures, whereas researchers were looking for information relating to their topic for themselves alone. This doesn't seem to have affected the types of resources they use, or the amount of time they spend searching for information.

There were some differences between disciplines when it comes to information seeking. For instance, academics from the Politics department put a higher emphasis on the need for the most current information available than anyone from other departments. In the Economics department, getting hold of reliable statistical data was cited as very important, and those interviewed appeared to know exactly where to go (whether on the Internet or manually) to get hold of it quickly and easily. When trying to think of examples of information needs, it was a case of "I needed some statistical data, went straight to the MIMAS website, clicked on a few links and got it". This is quite different from those in the Sociology or Politics and Philosophy departments, who might have to judge information that is opinion-based rather than fact-based. Greater differences between subject disciplines may have emerged if this Phase had been conducted across different Faculties.

It is clear that teaching staff are discovering the kinds of problems which librarians and information professionals have been aware of for some time. Despite this, the interviews revealed great enthusiasm for using web-based resources in teaching and learning in exciting and imaginative ways. For the EDNER project, the study has shown that JISC's high quality online academic resources and services are reaching those who are at the forefront of the teaching and learning process. Most of this group of users had discovered JISC resources and found much to praise, particularly the Resource Discovery Network (RDN), while several further singled out the Virtual Training Suite (VTS) as a valuable training tool. Only one lecturer however articulated the key advantage of such resources, that they are managed and quality reviewed, and it is this awareness and discernment of the difference between high quality academic resources and other Internet material, which must be transferred to the learner for the future, as online information resources become an accepted part of the learning environment.

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