



Loughborough University academics' use of electronic search tools in the research process: a qualitative study

Dr Graham Walton
Service Development Manager
Library
Loughborough University

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Executive summary

At Loughborough University, undertaking research is very much a part of the academic fabric. Research work is also relying more and more on electronic systems and processes. Included as part of this trend is the development and availability of search tools (including both commercial bibliographic databases and free electronic search tools). The Library has established that the most effective way to support researchers is to increase the availability of electronic resources. This study was undertaken to gain a deeper understanding about how researchers use information services, specifically electronic search tools. This enhanced understanding would be used to continue improving and developing services to researchers at Loughborough University.

Data was collected through conducting semi-structured interviews with ten experienced academic researchers. The researchers were spread across the academic disciplines. Interviews were conducted by various Library staff. The limited number of interviews that took place is acknowledged, but despite this some important issues have been established. Interviews took place between June and September 2006.

The study shows that the researchers interviewed had a good knowledge of search tools. They are used throughout the research process. Use was concentrated on 2 or 3 particular search tools with Web of Science and Google being particularly popular. The researchers also had a high level of awareness of the different search strategies. A range of views were expressed about MetaLib with some enthusiastic and others not so positive. Google was valued because of its speed and ease of use.

The study has reinforced the need for researchers to have access to appropriate electronic resources. Seven specific recommendations are made as to how Library support for researchers' electronic search tool use can be further developed. This includes considering approaches to make researchers more aware of relevant resources. The high profile of Google as a research tool needs to be acknowledged and discussed. The perceptions of some researchers about MetaLib should be drawn to the attention of Ex Libris.

Executive summary

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1. Introduction

1.1 Rationale: In a research led University such as Loughborough, there is an expectation that academic staff undertake research alongside their teaching responsibilities. All researchers need access to information to provide context, inform methodology and shape conclusions and discussion. Increasingly, academic activities take place within the electronic environment. At the same time, the availability of electronic information is increasing both in terms of quantity and range. ScienceDirect (an electronic publisher that gives access to scientific, technical and medical information) announced in November 2006 that one of its 11 million users had just downloaded the billionth article (ScienceDirect, 2006). The publishing model for disseminating research is rapidly changing through developments such as e-journals, open access journals and institutional repositories.

Dramatic changes have also occurred as printed indexes and abstracts have evolved into online databases and electronic search tools. There are a wide range of commercial databases and free search tools which allow people to locate material for their research. For this study, the term 'search tool' was used for both commercial bibliographic databases such as Web of Science (acquired by the Library at significant cost) and freely available Internet search tools. Each search tool is a discovery tool which retrieves information (including bibliographic information) based on keywords. These discovery tools increasingly have features which allow searchers to link to full text articles in e-journals from the references identified.

1.2 Research support at Loughborough University Library: Much importance is attached to research at Loughborough and indeed it counts for nearly half the University's income (Loughborough University, 2006). The Library has a crucial role in providing researchers with access to the information they need to undertake successful research activities. Academic Librarians raise awareness of, and deliver training in, the use of discovery tools so that researchers can find the full text documents required. It has become apparent that for the majority of disciplines, the researchers main requirement is for both discovery tools and electronic content to be available at the desktop. It is crucial therefore that the Library supports research by making more electronic information available (Lund, 2006). Loughborough University Library gives researchers access to around 250 commercial databases. At the same time, the Loughborough researcher (as does everybody) has free access to search tools such as Google. There are concerns about the quality of the information available from Google and developments such as Google Scholar are trying to address this. Loughborough University Library also provides MetaLib (Stubbings, 2003). This is a tool that enables a library to provide a single access point to web databases. MetaLib also allows simultaneous database searching across various information products. With the Library Catalogue, it serves a further purpose in being the main way to locate specific e-journals. A recent study did show that Google Scholar compared favourably to MetaLib (Webber and Boon, 2006).

1.3 Focus for study: If the Library is to continue supplying high quality support to University researchers, it needs a detailed understanding of how researchers approach using the information services it provides. This study aimed to develop a deeper understanding about how experienced researchers use search tools and electronic databases. It builds upon an earlier general survey of researchers and library support completed by the Library (Bigger, 2003). The 2003 survey showed that 63% of researchers used the Internet on a daily basis. 4% never used the Internet, compared to 36% who never used MetaLib. The commercial databases supplied by the Library were used by 12% of researchers on a daily basis. In 2006 it was decided to build on this initial work by undertaking a study on the nature of search tool use. The following questions provided the focus for the exploration:

- What does the researcher understand by 'electronic search tool'?
- What are their attitudes towards searching the literature as part of the research process?
- What are the general strategies used in their searching?
- What are their views on search tools?

2. Methodology

2.1 Approach: With the focus being concerned with understanding and attitudes, one-to-one interviews took place to gather the data. The focus was on experienced researchers in the University because of their depth of experience and knowledge. It was also important to interview academics

across the University rather than focussing on specific disciplines. A total of ten academic staff were interviewed as part of this study. This cannot be seen as a representative sample of all academic researchers at Loughborough University but it does provide useful indication of the researchers' views and perspectives.

Ideally, a larger number of interviews would have occurred for purposes of validity. For reasons of time and resources, it was decided to limit the interviews to ten in total. Concerns about depth and breadth have been partially addressed by interviewing researchers with both substantial experience and from a wide range of academic disciplines. These limitations in methodology informed how the results have been interpreted and the conclusions reached.

2.2 Interview process: By liaising with the University's Research Office, details were established of suitable possible interviewees. Those interviewed for this study are listed in Appendix 1. Their research interests included the following: information systems, knowledge management, health care engineering, photovoltaics, inequalities in health outcomes, use of lasers in engineering, environmental changes from lake sediments, condensed matter theory, probe field ion microscopy and engineering alloys. The interviews were conducted by the Library's Service Development Manager (Graham Walton) and the Academic Services Managers (Lizzie Gadd, Peter Lund, Steph McKeating, Ruth Stubbings). These individuals formed the group that

considered the resulting data and developed the conclusions and recommendations.

The interview protocol was piloted in June 2006. The resulting changes included making the questions more precise and reducing the number. A standard data recording template (Appendix 2) was produced for the interviews to ensure consistency in the data collected. The form also included a series of lower level questions that could be used to develop discussion. The interviews were not recorded but interviewees produced a summary of the interview using the template. A total of ten interviews took place between June and September 2006. The data from all interviews was collated and brought together under the broad themes being investigated (Appendix 3).

3. Results

3.1 Researchers' understanding and awareness of electronic search

tools: All the researchers interviewed were informed and conversant with electronic search tools. They had been using them for a number of years and had very clear perspectives as to their purpose and range. Google was frequently identified as an example of a search tool. The majority of interviewees differentiated between search tools (e.g. Google) and electronic databases (e.g. Web of Science).

3.2 Researchers' attitudes towards searching the literature as part of the

research process: The general consensus from these researchers was that

most search tools were easy to use. Without exception, the researchers identified that search tools had to be used in their investigations. The current availability of these research tools was acknowledged as giving them unparalleled access to information.

The researchers were less likely to use a source if it was seen as being particularly difficult to use. It was apparent that search tools were used throughout the research process but most often at the beginning of a project. Search tools were used at later stages to find information to check hypotheses, to find new direction and to make sure nothing had been missed. Researchers also used them specifically to identify key authors and subject content. For some there was the view that using electronic sources brought a sense of serendipity. The researchers attached importance as to how quickly they could access a search tool and also the speed with which a search was conducted. Google emerged prominently as being used by researchers. Some used it just at the beginning to make an initial start whereas others were accessing it more and more for research.

3.3 Researchers' choices when using search tools: The majority of researchers interviewed tended to concentrate their use on a limited number of search tools. They would appear to rely on two or three that they are familiar with. The two most popular are Web of Science and Google. The level of the search influences the choices made. At the initial stage of a project or when a quick, broad search is needed, Google is the main choice. For the more detailed, exhaustive search then other databases are accessed. The

ability to locate full text sources is perceived as a major strength of specific search tools. It is likely that the expectations to access full text will increase. A reason for using MetaLib is the feature of being able to simultaneously search across databases. For some researchers, being able to use Endnote bibliographical software with a search tool was seen as being important. Endnote offers some functionality complimentary to RefWorks (notably the ability to store PDFs and the ability to be used without recourse to the internet).

3.4 Researchers' general strategies used in their searching: As would be expected with experienced researchers, there was generally a high level of awareness of different search strategies. All were aware of the need to establish keywords and the option to restrict searching to fields such as 'author', 'title' and 'abstract'. There was also an understanding of the different merits of natural language vs. controlled language searching. Pragmatic approaches were apparent where phrases/words were cut and pasted into search tools. Some made a point of searching for specific journal titles whereas others felt this was too restrictive. Variances also emerged in how far back people would search. This ranged from only requiring papers published after 2000 to going as far back as 60 years ago. Researchers in this study demonstrated an understanding of using search strategies such as Boolean logic, truncation, synonyms and alternative spellings.

3.5 Researchers' views on search tools: Included among the search tools/databases mentioned as being used by the researchers were MetaLib,

Google, Web of Science, SciFinder Scholar, Medline, Compendex, Inspec, ArticleFirst and ZETOC. The most in-depth comments received concerned MetaLib and Google. There were various different perspectives of MetaLib. Some used it frequently and enthusiastically, highlighting the value of the cross database searching and the SFX function. For the researcher working in the multi-disciplinary team this feature was less attractive. Others found it confusing, slow, difficult to use and not very intuitive. There was also a concern that it generated too much data. For some, its use was restricted to the service for locating specific e-journals. In the context of the inter-relationship between teaching and research, researchers did not appear to direct students to MetaLib for their learning. The value gained from attending a Library training session on MetaLib was mentioned by one researcher.

Researchers also had various views about Google in the research process. It was used by most researchers but they were aware of its deficiencies. These included the quality of the sources retrieved, the limitations of its ranking system and its effectiveness. The strengths of Google revolved around its ease and speed of use. Various academics felt that Google Scholar was addressing some of its inadequacies. Having a single search tool for everything was identified as the ideal and Google was seen as the closest to achieving this.

4. Conclusion and recommendations

From the outset, it has to be acknowledged that this study has limitations through the small number of researchers interviewed. It does provide the Library with some useful intelligence it can use to further support University research. Academics attach great importance to using search tools in their research, and they tend to use a limited number and go back to those which they feel are easy to use and produce quick results. Having a single search tool for everything was seen as the ideal. Increasingly access to full text is seen as being important. If full text is not available, the time needed to follow up references is seen as a disadvantage. There is a good understanding of search techniques. Some researchers indicated they often needed to search back over a number of years. Even though the level of uptake of alerting services was not the focus of this study, it was apparent that this kind of service had made a limited impact.

Both Google and Web of Science were popular with these researchers. Google was used by most researchers at some stage in their research. This fact contributes to the debate about where Google fits into the academic environment. MetaLib is seen by some researchers as being a very significant service, but for others it has a very low profile and is not perceived as being particularly useful. The Library invests significant resources to make MetaLib available and to promote it within the University. Experienced researchers in the University have a major role in developing people who are at the beginning of their research career.

The use of one-to-one interviews in this study proved a useful approach. It involved Library staff and academic staff engaging in in-depth interactions. Pressures of work for all means this does not occur very often. Apart from allowing detailed data for this study to be gathered it also provided service promotion opportunities. In terms of further study, it would be useful to replicate this study with novice researchers.

The following recommendations are made:

1. New researchers in the University should be considered as a separate Library community with its own information needs. Strategies should be formulated which identify and target new researchers. *(responsibility of Academic Librarians, Peter Lund and Marketing and Publications Group)*
2. The Library should enhance how it engages with the wider University research community to ensure that the Library meets their information needs. *(responsibility of Peter Lund)*
3. The Library should continue to promote the purpose and benefits of MetaLib and its constituent databases to researchers, detailing how these tools complement Google. *(responsibility of Library Marketing and Publications Group, Academic Librarians, ILSS Group)*
4. It is important that the Library continues to ensure full text electronic resources are branded as 'Supplied by Loughborough University Library' *(responsibility of Marketing and Publications Group).*

5. Appraise Ex Libris to the findings of this study so that they are aware of the differing views of researchers as to the usefulness of MetaLib for the mature researcher. *(responsibility of Steph McKeating)*

6. Make this report available to the LLOs so that they can discuss the findings with their departments and help Academic Librarians in promoting and encouraging the exploitation of all library resources and services.

(responsibility of the Library User Committee)

7. The Library should consider increasing its expertise with Endnote so that researchers can be provided with necessary support. *(responsibility of Peter Lund and Academic Librarians)*

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Appendix 1 Academics interviewed and date of interview

Amit Chandra (Wolfson School, 5th July 2006)

Louise Cooke (Information Science, 10 August 2006)

Crispin Coombs (Business School, 15th June 2006)

Ralph Gottschalg (Electronic and Electrical Engineering, 6th July 2006)

Paula Griffiths (Human Sciences 16th August 2006)

Thomas Jackson (Information Sciences)

Jonathon Lawrence (Wolfson School 29th June 2006)

David Ryves (Department of Geography, 5th September 2006);

John Samson (Physics, 5 September 2006)

Rachel Thomson (IPTME, 8 August 2006)

Appendix 2 Template used to record data from interview with researchers

Name etc:	
Department:	
Date of interview	
Broad area of research	
1) Explain the purpose of the study	Purpose is to explore how the University Library should best give access to electronic search tools. To look at how Metallic should develop. Gain a better understanding of how researchers look for information and how Library can support the process
2) Understanding of phrase 'electronic search tool' <ul style="list-style-type: none"> • What do you understand by phrase 'electronic search tool'? • 	
3) Broad attitudes towards search tools in the research process <ul style="list-style-type: none"> • What do researchers expect search tool to do? • Does nature of your research need access to search tools? • When do you use them in research (just at beginning or at end)? <p>How easy do researchers find them to use?</p>	
4) How choices are made in use of search tools	

<p>5) General search strategies</p> <ul style="list-style-type: none"> • How do you search the databases? • Controlled vs natural • Looking for authors/ specific journals/ subject • How far back do you search? • Just a few references vs exhaustive 	
<p>6) Views of specific search tools</p> <ul style="list-style-type: none"> • How does 'Google' figure in your searching? Thoughts on 'MetaLib' • Other databases they may use • Easy vs difficult • Give good quality information vs poor quality 	
<p>7) Any other comments on electronic search tools</p>	

Appendix 3 Data from interviews

Understanding of phrase 'electronic search tool'

Understanding has changed over the years. Has to be electronic, on the internet. An electronic search tool could be: SciFinder Scholar, Google, Google Scholar, MetaLib or a library catalogue

Electronic search tools are a tool that enables you to retrieve information that is store electronically, e.g. Google. Sees search tools and databases as separate tools that have different functions.

Anything which searches large pools of electronic data. Ranging from Google to Inspec
A tool which allows you to find information on your subject of choice.

Been using them since the mid 90s. Sees Google as being crude search tool where as Web of Science is more refined

Tool to undertake searches across literature and other databases and web pages.

Electronic search tools means services like Google. Calls indexes like Web of Science databases

Electronic search tools means services like Google. Calls indexes like Web of Science databases

Broad attitudes towards search tools in the research process

- Searching depends on what you are looking for. Use them to find government legislation and white papers and reports. Use them to follow thread. Heavy searching at start but use them throughout research. Always go to Google for quick start. Only use Google for general information. Great being able to restrict it to UK only stuff. Good search tool should give you quality hits in first 5. Make a judgement on whether to follow up if it is a PDF/ web site/ PowerPoint presentation. Don't expect Google to be neat and tidy.
- Expects search tools to retrieve information or provide data about information. Search tools are good for serendipity. When using databases expect to retrieve good quality very relevant information. Use search tools and databases most heavily at the beginning of a research project, but will update as project progresses. Search tools are very easy to use. MetaLib easy to use, but it took a while to learn how to refine successfully on it.
- The best thing about SciFinder in particular is that it can be used to refine vague search terms into more clearly defined search terms. Many search tools (e.g. WOS and Google do not allow this). With SciFinder and WOS you can see how important a topic is.
- Yes the nature of research does need access to search tools. Much of it is biomedical research requiring access to PubMed, Medline, WOS, SciFinder
- A lot of literature searching is carried out at the beginning of research project using subject key words. Then, when you know who is working on the topic you search using authors. In addition to searching databases also searches the authors web pages. Searching tends to taper off at the end but uses authors more than at the beginning.
- Search tools are easy to use, but each one has its own quirks. Every search tool operates differently for instance in how searches are refined. Some have useful features such as linking to the full text.
- Expects search tool to give the results sought. Also to minimise the time spent looking. In an ideal world would also supply the full text but appreciates the difficulties involved (e.g. copyright). Knowing where to get the full text is useful. Research does require search tools as we don't want to re-invent the wheel. Uses engines on the internet and via the library. All types of information are sought including patents although not particularly interested in patenting his work perceives there to be a high cost and low reward for the effort involved in the patent process.
- Searches are carried out at the beginning, middle and end of research work. Searching for information is the very essence of research work. Finds search tools reasonable easy to use. Keywords and linking to full text is straightforward. Has years of experience though.

- Use search tools regularly for research. Whenever writing papers do a quick keyword search to check what other work has already been done in that field. A more in-depth search will be done later on, with search being gradually refined as research progresses. Find searching fairly intuitive and generally get the required results. May not be using the full functionality of the search tool.
- 's specialism is knowledge management which is a broad field meaning different things to different domains. He therefore uses search tools to generate relevant keywords and names of key people which he can then use on academic databases. He likes to use Kartoo.com which sorts your results into different aspects and visualises the relationships between the different topics. Wordnet.com also provides alternative terms for searching.
- He finds the technology that drives Google very poor (only keyword searching) but believes this may develop and improve with time. He likes MetaLib because he knows that all the results will be of academic quality. However, he feels it could be improved by allowing a cross-search of academic databases with the web. This way he could do both aspects of his searching (broad web searching for keywords and an overview, and fine-tuned academic research searching) via the one interface. In his field, he rarely finds full-text material on open-access.
- Don't feel particularly computer literate, use research students to do lot of ground work. Use search tools heavily at beginning of research. Also later in research to support hypothesis and/ or find new direction
- Used database in 90's (can't remember name) which was best one ever. Much easier to combine different searches than can do now. Familiarity is very important. Reluctant to use new databases because will have to 'learn' them. If feel comfortable with database will stick to it. Don't like it when you go to a database and it has all changed.
- Speed of use is important and also ease of use. Without exception will need to use search tool for research project. Will use it at beginning of research to produce authoritative list of references
- Important that references found are authoritative.
- Will also use search tool before publishing to make sure that have not missed anything relevant. Only use Google and Web of Science, both of which are easy to use. Find databases easy to use. Use Boolean logic, truncations and alternative spellings
- Google Now uses Google more and more, especially for finding definitions and information about particular researchers / authors. Uses Google in a very unstructured way throughout a search project. Finds Google easy to use.
- Databases Uses databases when searching for literature on a topic, or by a particular author and following up citations. Uses databases at the beginning and end of projects. Mainly uses Web of Science and finds it very easy to use.
- Expects search tools to assist in intelligent searching and help find the information you want. - Could do research without Google, but needs databases. Relies very heavily on subject databases for research. Will use Google at the beginning of a research project. Uses databases heavily at the beginning of a project, but also near the end to double check have everything. Google very easy to use. Databases are okay, but annoying and frustrating when they change their interface.

How choices are made in use of search tools

- Just use 'Web of Science' and Google. Web of Science far more focussed/ deeper. Use it for in-depth literature review. Easy to use but find ABI Inform not very good for health. Like citation tracking system.
- Depends on what information looking for. If looking for quick piece of information may use Google. Will find full text of specific articles using e-journals. If detailed literature search will use MetaLib. If information is very library oriented may go straight to LISA and just search that. MetaLib is first port of call for a comprehensive literature search. In the past it would have been individual databases .
- Likes WOS because you can import directly into EndNote. Secondary searches are carried out in Inspec and Compendex to check. Likes MetaLib because it groups his primary and secondary search tools together in one place. Importing into EndNote is

crucial. EndNote is compatible with others working in the group. Since much of the time is spent out of the office often where internet is not available (e.g. on the train) so prefers to use EndNote as it can be accessed via his laptop. Preferred way of working is to store references in EndNote with full text stored as a pdf. .

- All searches for research purposes start with MetaLib as first choice - within MetaLib mainly use Medline. Occasionally may use Google Scholar but would not use generic Google for research. Likes MetaLib's grouping of databases into subject categories
- When searching into a new subject area would initially use Google (and Google Scholar) to get a broad overview of the topic and how it relates to other fields/areas (i.e. not just academic fields). He is particularly keen to find out who the key experts are in a particular field and will then focus his search down to work they've produced. He finds this saves a lot of time reading peripheral material by little-known authors. After his initial Google Search he will use MetaLib and then the ACM Digital Library. He particularly likes the ACM DL because it provides links to full-text and citation linking. He will choose full-text databases over bibliographic ones simply to save time in locating material. As he is based in Holywell Park full-text databases save a long trek to the Library.
- Just stick with ones I know and that have used in past
- Use concentrated on two search tools (Google and Web of Science). Google for teaching and WOS for research
- Uses Web of Science, pre-print service and publishers web sites. Chooses these because he is familiar with them. Feels there is no point searching more than one databases as they all contain very similar things.
- Depends on what looking for, e.g. if know the journal is indexed by WOS will look there, if an Elsevier journal will go directly to ScienceDirect. If want to know general information on a topic will often use Google. If want specific information will search a subject specific service. Favourite database is Web of Science, very familiar with it and often has what looking for. If do not find what looking for on WOS will try next database

General search strategies

- Copy and paste white paper title and see what happens. Tend to be looking for document itself rather than summaries. Also looking for individuals list of publication. Tend to just search from 2000 onwards. First page of hits is really important. If lots of references just use first page. Using quotes is great way to search on Google. Use Google to find full text documents
- Depends on what looking for: - author: use last name, - keywords: start with broad terms and then refine, do use Boolean logic. Use natural language, but occasionally will use thesaurus if not finding what require or concerned about US spellings etc. Will limit by date but this depends on purpose of search e.g. keeping up to date or retrieving too many hits.
- Will start with a broad search. Searches are then reduced step by step, keyword by keyword, especially in a topic he isn't too conversant with. Sometimes uses Google Scholar to see how many hits are found and then tries to reduce it.
- Most topics are related to health care and WOS is the first database used. If only a small number of results are obtained then will try lots of other databases.
- Databases are searched at different levels. First a broad search which is then modified using additional keywords to narrow it down.
- Keywords are obtained from other research and from researchers. Tend to use controlled vocabulary where possible. Has been taught to use natural vocabulary in SciFinder.
- Will look for specific authors but tries not to restrict searches to specific journals.
- Mostly searches back to 1995 as tissue engineering only started about then. If learning about cells for instance will be happy to use older materials since they will still be relevant (cell biology hasn't changed much)
- Aims for a fairly exhaustive search. Keeps all searches and follows up on appropriate references. May go back to searches previously undertaken and consult other references.

- Starts off with broad based queries (e.g. solar cell(s) photo voltaic and then narrows down. Uses controlled vocabulary. Looks for keywords to describe what he is looking for and links keywords until around 20-50 results are obtained. Any less is too few. (n.b has previously worked as a data manager in an online searching environment where searches were charged per reference retrieved so accustomed to narrowing down search results.
- Looks for authors and contents but seldom looks for specific journal titles. Normally searches on title/keyword/abstract. Searches back as far as possible. Even material from the 1960s can be useful. Aims for 20-50 references.
- Use keywords to search but often find it difficult to identify all the possible synonyms and alternative keywords for the topic being researched. Initially limit search to more recent publications, usually last 5 years to make results more manageable. Will often go further back in time during more in depth searches later in the research process. Generally use Boolean AND to combine search terms and narrow search.
- Rarely search for authors unless searching for details of a specific recommended paper. Don't search for particular journals as this would narrow search unduly. Try to be as exhaustive as possible – don't like to feel papers may be missed. Limited use of controlled vocabulary using Medline headings.
- As mentioned above, will take a broad initial approach (keywords on Google) to generate specific terms and names for use in academic databases. When searching academic databases he tends not to use the thesaurus because he feels confident with the keywords he has already decided upon. Despite the fast-pace of his field, he sometimes seeks references from as far back as the 1960's if a seminal paper was published then. He finds that often pioneering researchers can be quoted so often that the original meaning of their words is completely lost. It is important therefore to have access to seminal papers no matter how old they are. His searching does go through a refining process.
- Once he has found some relevant papers, he used to use some summarizing software from Zentex.com which he rated very highly at summarising (not just abstracting) the full-text of papers. Unfortunately this no longer exists and the only alternative Copernic.com – a commercial product – is nowhere near as good and not worth the money. He believes that authors should not just produce abstracts, but key findings or “key messages”, so that busy researchers can skim over the data and make a judgement as to whether the paper is worth reading in full. Sometimes he will use snowballing techniques, but rarely used Web of Science for this purpose.
- wasn't aware of alerting services provided by many databases, but felt that he was on top of his field anyway (through journal editing and refereeing) so wouldn't benefit from such services.
- Look for key words. Really important to identify UK stuff. Search for journals retrospectively. Print is very important in searching. Browsing print journals allows serendipity that on-line does not. Have to keep telling research assistants to go to Library and browse. Often search as far back as 1985. Quantity of references does not matter as long as they are good. Happy to have 3 or 30.
- Mostly looking for subjects. Might look for names. Use help sheets when needing assistance. Go back quite often to 1945. Sometimes go as far back as 1800 (via library catalogues, antiquarian/out-of-print book searching engines).
- In research, looking to find all major papers. Grey literature is an issue. In journals where publish, reports etc are generally not accepted in citations. Also expectations in journals where publishes that will need no more than 3 citations to make specific points
- When using databases tends to search on author or keyword in the title or abstract. Forgets to use boolean operators but does remember when gets no hits back. - Does not use truncation or thesaurus or descriptors. Does use the Find related articles option in WOS. Searches on all years in WOS. When using databases is looking for an exhaustive list of references.
- Depends on what looking for :author: use last name, keywords: search each word individually and then combine them. Use natural language rather than thesaurus. Sometimes uses Find related article in WOS. Date range depends on level of project and current knowledge, but often last 5 / 10 years. Occasionally looks back to

1980's or even back to 1940's when looking for seminal papers. Mostly involved in large projects therefore searches tend to be quite exhaustive.

Views of specific search tools

- Re MetaLib do not use it for cross searching. Just use it to check for specific e-journal reference. Do not teach students about MetaLib (as I do with Google and Web of Science). For students, academic staff are 'gods'. If academic staff tell students to read or use something they will do it and nothing else. Have not told students to use MetaLib. Find MetaLib confusing and difficult to use.
- Students use Google and they are aware of its limitations. Need to get into psyche of academics to get them to use MetaLib more. Certainly do not use it as research tool. Needs to be easier to use. Also would use it more if it was more relevant for students. Cannot avoid link between research and teaching. Starting to use SOSIG
- Google is easy to search but it is not always effective. more. If unfamiliar with a database it can take longer to find what you want. MetaLib is relatively easy to search, but it could be more intuitive. Sometimes it can be slow, which is frustrating and it would be nicer if it was quicker. Finds MetaLib very useful and wonders how ever managed without it. Likes the cross searching functionality within MetaLib rather than having to search databases individually. Down side is that you can retrieve far too much information.
- Google Scholar is really useful. Uses Advanced searching features such as excluding search terms. Links to the full text is useful.
- MetaLib isn't very useful as a search tool. Now realises that it is useful to search by resource category / departments although the department structure isn't very important to him since much of research undertaken is multidisciplinary (in Amit's group there is a: polymer engineer, a chemical engineer, a pharmacist, a cell biologist, an electronic engineer and a manager)
- MetaLib is useful as a way of finding relevant databases but is poor as a search tool. Databases are searched individually using the native interface.
- Use EndNote to store references as is often collaborating with researchers at Nottingham University who are using EndNote. Would appreciate coaching on using RefWorks (now provided: 11/7/2006)
- SciFinder Scholar, Medline, WOS, Google Scholar are all pretty easy to use.
- Good quality information vs poor quality – depends on how conversant you are with the search tool and how well you can narrow the search down. It will take a few iterations to narrow the search sufficiently. Will tend to avoid non-academic references since has had experience of papers being refused if they have too many non-academic references.
- Google is seldom used as it retrieves inappropriate material.. Sometimes goes straight to MetaLib though sometimes finds it a bit awkward so may search for example, Inspec direct. MetaLib is used as a first attempt or for a simple search. If not quite sure what is needed will search databases individually e.g. WOS, Compendex, Inspec and sometimes via MetaLib, ArticleFirst. Sometimes uses ZETOC table of contents service.
- Doesn't find them particularly difficult – just irritating since buttons are often moved around (either on different databases or between different versions of databases. Doesn't want to have to use a manual. Recognises that although there are mistakes in scientific literature there are less than appear in Google. Scientific literature databases tend to retrieve more higher quality information. Will use Google Scholar sometimes because it links to sources but usually aims for scholarly scientific information sources.
- May occasionally use Google Scholar for research. Uses Google for other work-related purposes e.g. finding contacts at other universities.
- Does not use any other search tools. MetaLib seems to work well and can find what you want. Particularly like SFX feature allowing you to identify what can be obtained from the Library. Only use the MetaLib cross-search interface for searches – do not go to the native interface of the various databases.
- Web of Science: use it all the time. Get the information quickest. Use it because I am familiar with it.

- Compendex: don't use it any longer. Too complicated. Google: use it for research as well but not as good as it used to be. Don't expect it to locate journal articles. Google ranking is poor, often find the most useful information later at lower end of list
- MetaLib: don't use it. Tried once with a research assistant but gave up as too complicated. Have tried to use it to cross search but didn't bring up great deal of more references. (was not aware of 'My Library' and the bringing together of subject resources)
- Google: know a bit about how it works. Easy to use. Rarely use for research. More for teaching when want to find images, websites to support courses. Also use it to find people's details (i.e. e-mail addresses). Also speedy in response. Web of Science: main database for academic purposes (use 95% of the time). Easy to use
- MetaLib: very rarely use. Have used it to cross search databases. Not aware of the 'My space' function but can see a lot of potential for research in this application of problems with adding electronic journals (suspended function) and electronic journals limited to those LU subscribes to (several key journals not at LU).
- Has not used MetaLib much. He feels it is a metasearch tool and feels he does not need to search more than his favourite databases. Uses current awareness services such as TOC from ScienceDirect and News bulletins from professional associations. See also question 3
- Do not use MetaLib very much. Wonders whether she should use it more. Feels MetaLib quite broad and never sure which category to choose to search. Research students in the department use MetaLib a lot. The students see it as the way into everything. (

Any other comments on electronic search tools

- What would be lovely is if there was a definitive search tool. (i.e if you searched here it would be comprehensive for this particular subject. Material is still found by serendipity. You still need skills to find material. Attending classes on searching databases really helps.
- Searchers dream is to have everything available in full text. Can think an item is going to be of interest only to discover when it arrives that it is only of marginal value. Full text availability can save trees, although there is still the temptation to print off and assess later. Believes search tools and databases are different and have different functions. Privileged to have so much to hand and delivered to the desktop.
- Couldn't live without them. Would be useful to have *Progress in Photovoltaics* (published by Wiley) in electronic format as this is the most used journal in the field and consulting hard copy in the library is relatively time consuming.
- Generally happy with the level of use and results achieved. Useful feature in MetaLib would be "people who used this search term also used this search term" as an aid to keyword selection. It was very useful to receive a half hour introduction to MetaLib from Frank Parry held in the Human Sciences department, as academic staff often find it hard to go to the Library and attend Lunchtime in the Library or Database of the Month sessions.
- He felt that the increase in search tools increased the pressure and expectation on academics to have covered everything in their searching. He felt it would be nice to have one search tool that did covered everything (web and academic databases) but that the closest we've got at the moment is Google.
- He felt that the way new and trial databases were advertised to academics could be improved. The current system of going via LLOs meant that academics received a "forwarded" email, and forwarded emails always take lower priority in their In-Box. He suggested a direct mailing list to all academics that they could opt out of if they weren't interested in receiving new mailings on databases. We discussed the possibility of LLOs giving an information update at Staff Meetings. He felt that recommendations from colleagues held more weight than notifications from the Library.
- Onus is on us to look at all databases but we don't have the time. Subconsciously got to Web of Science because I know it will not change and will give me quality references. Quick and easy to use. Search tools used meet needs and well acquainted with 'and' 'or' 'not'. Still need paper