

**Researchers' Use of Libraries and other Information Sources:
current patterns and future trends**

Final Report

**Education for Change Ltd
SIRU, University of Brighton
The Research Partnership**

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EXECUTIVE SUMMARY

This study was commissioned by the Research Support Libraries Group to provide a detailed up-to-date picture of the information sources researchers both use and require, of how they work with these resources and to identify major emerging trends in these patterns, including any differences in patterns of working between the disciplines.

The research methodology included an extensive literature review, a major questionnaire survey of individual researchers and two sets of focus groups of individual researchers drawn from a range of institutions, disciplines and levels of seniority. The first set of three focus groups assisted with the design of the questionnaire. The second set of five focus groups helped to validate the outcomes of the survey.

The survey findings were based upon a sample survey of 3,390 researchers drawn from the 2001 Research Assessment Exercise (RAE) Census. In order to ensure a representative sample across the United Kingdom and across all levels of research additional samples were drawn for Wales and Northern Ireland together with a sample of junior postgraduate researchers from seven HEIs across the UK. A response rate of 45% was achieved overall.

Nature and range of material required by researchers

Researchers were asked to indicate what materials they considered essential to their research. A number of interesting similarities and differences emerged between the broad subject disciplines. Three areas proved particularly significant: the use of books and printed journals, the importance of electronic journals and the low use of non-text research materials.

The use of books and printed journals

The overwhelming importance of books across all subject disciplines was very evident. It is not only researchers in the Humanities and Social Sciences who require access to books. At least two thirds of researchers in the Sciences view books as essential. This view was endorsed by the focus groups but was not supported by the literature, which provides little evidence to support the importance of books.

It was less surprising that 95% of researchers perceived printed refereed journals as essential. The advent and popularity of electronic journals has not yet reduced the importance of the printed journal. This reliance on printed material is expected to continue across all disciplines for some time; in particular the Arts and Humanities community believe they will be reliant on printed material for many years. This latter group also make relatively heavy use of printed 'non-refereed' journals.

The importance of electronic journals

The discipline divide is very apparent in terms of electronic access. Medical and Biological Sciences research is focussed heavily on journal literature and primary data and three quarters of this group view electronic access to e-journals and electronic full text services as essential. Conversely, less than a quarter of researchers in Arts and Humanities and Area Studies and Languages perceive electronic access to journals as essential. The focus groups indicated a positive relation between the low level of use in the Arts and Humanities and the relatively fewer number of journal titles available in electronic form.

Low use of non-text research materials

Non-text research materials, including computerised data sets, photographs and still images, moving images and artefacts, attracted surprisingly low levels of use. There were indications that digital images will become increasingly important to the science research community.

Nature of access to research materials

Researchers were asked what main access and discovery methods they used. There was a great deal of consistency across all subject disciplines in the importance accorded to consulting printed books or journals, inter-library loan and document delivery and searching catalogues.

Disciplinary distinctions were evident in two areas: the importance of physical access to libraries and collections and the use of library services for enquiry and research assistance.

Physical access to Libraries

Twice as many researchers in Area Studies and Languages and Arts and Humanities consider physical access to libraries and collections essential to their research as their colleagues in the Social Sciences and over three times as many as researchers in the Medical, Biological and Physical Sciences. Few scientific researchers consider the serendipitous benefits of browsing through print collections essential, in stark contrast to the Arts and Humanities and Area Studies and Languages researchers.

Enquiry and research assistance

Overall, a quarter of all researchers make use of enquiry and research assistance. However, the Arts and Humanities, Area Studies and Social Scientists are significantly more likely to use these services than their colleagues in Medical and Biological Sciences and Physical Sciences and Engineering.

Location of research materials

Some important differences are evident between the Sciences and the Arts and Humanities research community in terms of the diversity of research information providers considered essential.

The physical location of material is becoming a secondary issue to researchers in Medical and Biological Sciences and Physical Sciences and Engineering as a widening range of relevant material becomes available electronically.

Researchers' own and institutional resources

Despite evidence in the literature to the contrary, the study survey showed the overwhelming importance of the home university library to researchers across all disciplines. Over 80% of researchers perceived their institution's library as essential to their research.

Levels of satisfaction with the home library appear reasonably high with very little difference across the subject disciplines. However there was a universal demand for better general or specific journal provision (electronic or printed). There were signs reinforced in the focus groups, of a widening gap between researchers and the physical library building.

Researchers in all disciplines made great use of their own private research collection and also report an increasing use of colleagues, conferences and research networks to identify and obtain research information.

Use of other university libraries

Relatively few researchers in the sciences considered any other university library essential to their work. This was in contrast to researchers in the field of Area Studies and Languages, and to a lesser extent the Arts and Humanities.

Use of the British Library and other national/regional research resources

The British Library is considered essential by over one third of the researchers in all subject fields and by over half of researchers in Area Studies and Languages and Arts and Humanities. However it was not possible to determine whether this indicates the usefulness of the ILL/document delivery services or actual visits.

All other national and regional providers mentioned in the survey are considered essential by substantially fewer of the respondents. While a significant number of researchers from the Arts and Humanities use museum and archives few regard them as essential to their research. What was particularly surprising was the low level of significance attached to the other copyright libraries.

Access to electronic information sources and services

Researchers were asked to indicate the importance of a range of search and discovery methods. Less than half of all respondents rated any method as very important. However the most popular method of resource discovery employed was the online catalogue of the home library.

Web search engines and subject gateways

The Internet is clearly a significant research tool across all disciplines. Even in Arts and Humanities where use of electronic journals and information sources is relatively low, researchers make use of generic search engines such as Google and Yahoo, electronic discussion lists and web sites of important organisations on a regular basis.

In contrast, less than a third of all researchers view mediated subject gateways, including institutional gateways and those provided as part of the Resource Discovery Network, as essential to their research. Awareness of these gateways was low, a finding backed up by the focus groups, where some suspicions were voiced that subject gateways constrained freedom of choice.

Perceived advantages and shortcomings of electronic access

There were significant contrasts between the disciplines on how easy it is to find, access and use information electronically, compared to more traditional means. Not surprisingly the science community are most at ease with electronic access with the Arts and Humanities researchers the least confident group. Nevertheless, across all disciplines a similar pattern emerged: *finding* information electronically was deemed easiest to do; *accessing* the information was more difficult and *using* it more difficult still.

A desire was evident across all disciplines for print copies of electronic documents, although this was stronger amongst the Arts and Humanities and Area Studies communities. Researchers in the Arts and Humanities and Area Studies and Languages were also more worried about the quality and provenance of electronic information.

Training, advice and guidance in using electronic sources

There was a perception amongst researchers that training was not required. The survey showed that over half of all researchers either do not take up training or advice when it is offered or are unaware that it is available. Less than one fifth of all respondents had received some form of training, advice or guidance in the past two years. Even fewer researchers in the scientific community had been in receipt of training; they were also less likely to seek advice or guidance.

Despite this negative response toward training there was a very strong degree of unanimity across all disciplines about the areas they would like to know more about. These included specialist on-line search skills and ways of keeping up-to-date.

Possible changes in access and use of materials

On the whole the research community was conservative about their future research requirements and methods. The large majority anticipated few changes in the current situation. There was some indication of change in three key areas: the use of research materials and sources, the use of research information providers and access and discovery methods.

The use of research materials and sources

A majority of all researchers, irrespective of their subject area and their current research requirements, envisaged using electronic materials and sources more in the future. There was also an indication amongst the Medical and Biological Sciences community that they will be using moving images more in future.

A major difference in response arose between the Arts and Humanities on the one hand and Medical and Biological Sciences and Physical Sciences and Engineering communities with regard to future use of printed refereed journals. One quarter of the Arts and Humanities community expected to use printed refereed journals more, whilst one third of the scientists anticipated using printed refereed journals less.

Use of research information providers

Very few respondents foresee any change – either increase or decrease in use – in the range of information providers they currently use. A quarter of Arts and Humanities and Area Studies and Language researchers are more likely to use other university libraries, including the British Library and those outside the UK more. But there was little evidence to suggest that other information providers, including the other copyright libraries, will be used more.

Changes in access and discovery methods

The overall perception amongst all researchers was absolutely clear that the future is electronic. All researchers expect to access e-books and e-journals more in future. Equally they expect to use Inter-library loans and document delivery and on-line catalogues more.

Regional and resource differences

There was an expectation that the survey results would reveal some contrasts between sub-groups. The results were therefore analysed according to a number of categories including by age group, region, different types of HEI and CURL and non-CURL members. In fact, very few differences were identified, a finding which is itself significant.

Type of HE institution/library spend

There were variations in responses from researchers in different types of institution and in those with different levels of library spend. For analysis purposes, responses were categorised to reflect the two stages of university expansion in the latter part of the 20th century: the creation of the 'Robbins' and 'Technology' universities in the 60's to 70's and the abolition of the binary divide in the 1990's.¹

Significantly more researchers in the pre-1962 group regard their own university library as essential. Researchers in this group were also significantly more satisfied with their own university library than those in the 1962 – 1991 and post 1992 groups. Institutional library spend per FTE correlate closely with type of university and it was therefore not a surprise to find that the views of the importance and effectiveness of their own university libraries followed the same pattern. It also confirmed the assumption that the large research collections of many pre-1962 universities affect researchers' use of, and attitude towards, their home university libraries.

¹ See section 6.4

Conclusions

The Study found evidence of some significant differences in research requirements and behaviour between the subject disciplines. These differences are apparent in three areas:

- diversity of required research materials and research resource providers
- continued importance of physical access to research resources
- requirements for mediated information and library services, including skills and awareness-raising activities

Further conclusions relevant to all subject groups emerge on:

- increasing importance of remote resource discovery and retrieval of physical research resources
- low levels of use and awareness of research resources outside the higher education sector
- effectiveness of mediated subject gateways and portals as a means of accessing electronic research resources

Diversity of required research materials and their providers

The Arts and Humanities and Area Studies and to a slightly lesser extent the Social Sciences research community draw upon a very wide and diverse range of research resources and providers, although currently only books and printed journals are deemed to be of high importance. The Medical and Biological Sciences, Physical Sciences and Engineering are in contrast strongly reliant on their institution's library, whilst increasingly their research needs are served electronically.

Although technically many electronic resources can be accessed, or made accessible, from any location, researchers are highly dependent upon their own institution's library and its ability to fund and provide the appropriate and increasing range of electronic information sources, inter-library loans and document delivery.

The continued importance of physical access to research resources

The "culture" of research was invoked by several of the Arts researchers in focus groups to explain the importance of physical access to and handling of research materials. Perceived barriers to accessing research collections in other locations, such as time, travel and access arrangements, have no impact on the conviction of this group that physical access will remain essential. We recommend that further research is carried out to overcome perceived (and real) barriers to physical access **targeted in particular** at the Arts, Humanities, Area Studies and Social Sciences.

Requirements for mediated information and library services

As the requirements for research materials in different subjects increasingly diverge between the Sciences and the Arts, so too does their use of enquiry and research assistance. Assistance from library staff is significantly more important to researchers from the Arts than the Sciences. For the Scientists such assistance may be linked with their negative perception of training.

Comparing this with the lack of awareness shown by the research community of electronic information resources, such as mediated subject gateways, suggests that academic library services are currently failing to deliver the right kinds of training, advice and guidance to researchers on finding, accessing and using electronic resources.

We recommend to conduct a review and needs analysis exercise in the area of skills up-grading and awareness-raising for researchers, applicable and transferable throughout the higher education sector. We also recommend that a review of the appropriateness of mediated library services should be carried out in the light of the current and changing requirements of researchers, across the different subject disciplines.

Importance of remote resource discovery and retrieval

The study clearly indicates the continued and increasing importance of searching catalogues of library holdings for researchers in all disciplines. This finding emphasises the paramount importance of comprehensive on-line catalogues of nationally distributed research holdings linked to fast, efficient and effective inter-library loan and document delivery services.

The study found a low level of use of non-conventional research resources such as moving images, broadcast materials and maps. In order to bring this rich source of research material within the scope and knowledge of academic researchers it is recommended that the resources of relevant specialist collections, should also be included in national on-line catalogues.

Research resources outside the higher education sector

The Study clearly showed that national museums and archive services had a very low profile amongst all researchers, even in Arts and Humanities. It is recommended that the non-HE research resource institutions carry out more work to promote their collections and services.

The effectiveness of mediated subject gateways and portals

The case for mediated subject gateways and portals – both national and institutional has clearly not been made convincingly to researchers from across all disciplines. It appears that many researchers are simply unaware of the existence of mediated subject gateways. We recommend that careful consideration should be given by JISC and others as to how these gateways are conceived, structured, delivered and promoted to researchers.

INTRODUCTION

The purpose of this study is to provide the Research Support Libraries Group (RSLG) with a detailed, up-to-date and forward-looking picture of researchers' requirements and use of information sources. It describes current patterns in how researchers in and across discipline groups work with these resources and identifies major emerging trends. It is part of a broader programme of fact-finding and dialogue with the higher education community undertaken by the Research Support Libraries Group.

HEFCE commissioned the study in July 2001 on behalf of the RSLG and issued a contract for the work in August 2001 to a consortium comprising Education for Change Ltd., The Research Partnership and the Social Informatics Research Unit at the University of Brighton. The full specification for the study is appended as Appendix 1.

Research methodology

The consortium, in consultation with a Steering Group chaired by Professor Robert Burgess, Vice-Chancellor, University of Leicester, devised a research methodology focusing on a major questionnaire survey of individual researchers. The survey was preceded and supported by a literature review and a number of focus groups meetings.

Literature review

The purpose of the literature review was to synthesise key issues in order to develop the research questions.

An extensive search of electronic and printed literature sources preceded an analysis of documents using a framework instrument which identified key subject areas and correlated them with the three main strands of the research; namely

- What information sources do researchers use / require?
- How do they use the information sources they need?
- What are the emerging trends in information location, access and use?

In addition to accessing published and unpublished literature, the consortium also posted an email invitation for comments and submissions to LIS-LIRG, the JISCmail list for discussion of research and evaluation across LIS sectors, and elicited some very positive responses by individuals or organisations who had conducted their own surveys and who kindly provided details and results.

A full bibliography of sources is provided as Appendix 5.

Focus Groups

Two sets of focus group meetings were convened from among individual researchers: the first three Groups were asked to assist in the preparation of the survey questionnaire instrument and the second set of five Groups were asked to help validate the outcomes of the survey. The discussion topics for both sets of focus groups are provided as Appendix 3.

INTRODUCTION

Preparation

The initial series of 3 focus groups were held at the University of Brighton (10 members), King's College London (9 members), and the University of Newcastle (5 members).

Subject coverage across the groups was broad, and included the clusters of Clinical subjects, Sciences, Engineering, Social Sciences, Humanities and Arts.

Validation

The second set of 5 focus groups were held at Edinburgh University (5 members), Birmingham University (7 members), Manchester Metropolitan University (5 members), Bristol University (9 members) and HEFCE London (6 postgraduate members). Once again, subject coverage across the groups was broad. In all cases the meetings drew upon participants from a number of higher education institutions in the area.

Survey

The survey findings reported upon are based upon a sample survey of 1428 academic researchers drawn from the 2001 Research Assessment Exercise (RAE) census. In addition, there was a supplementary sample of 224 postgraduate researchers.

Samples

The universe for the study was defined initially as 'all researchers' although subsequent discussions with the Steering Group refined the focus to researchers working in Higher Education institutions (HEI) across the UK. Several options for a sampling frame were assessed and it was concluded that the 2001 RAE Census would provide the most comprehensive (the Census identified around 50000 active researchers) and up to date (the Census date was 31st March 2001) source. A total of 3390 researchers were selected from the Census.

Certain groups of researchers were excluded from this sample, such as those employed by the NHS, and staff who had left their institution but whom may have been cited in research submissions. Analysis of the distribution of in-scope researchers showed that HEIs in Wales and Northern Ireland accounted for relatively low proportions of researchers. A proportionate sample would have resulted in too few respondents in these countries, and so their samples were boosted to provide reliable samples. Other than this over-sampling an entirely representative sample was drawn, having stratified researchers by institution and subject area. The geographic over-sampling was subsequently corrected by the application of weights applied to the data to ensure the correct country balance of researchers: all data reported are based upon the weighted analyses.

The RAE potentially under-represents junior postgraduate researchers, who would be less likely to be submitted as part of research submissions. It was decided, in the absence of a supplementary sample frame of suitable quality, to approach 10 HEIs across the UK to provide an additional sample of junior postgraduate researchers. Seven of these agreed to help by inviting junior postgraduate researchers to take part in the survey.

Questionnaire

The questionnaire used in the study is appended to this report (Appendix 2). An initial version was tested with some of the respondents at the initial focus groups. The resultant questionnaire was then mailed at the end of November 2001 to 300

researchers sampled from the RAE Census for the pilot study. A web-based version of the questionnaire was also made available for those that wished to complete it online. Pilot researchers were asked to complete the questionnaire and to comment upon any questions that were difficult to answer, poorly worded, etc. All respondents of 76 questionnaires were returned during December 2001, the feedback from which helped to refine the final questionnaire.

The revised questionnaire was mailed to all 3390 researchers in mid-January; the revised online version went live at the same time. Non-responders were sent a reminder questionnaire, covering letter and reply paid envelope at the beginning of February.

Response rate

A total of 1428 completed questionnaires was received from the RAE derived sample by the cut-off date. In addition, 12 completed questionnaires were received later – a total of 1440. There were a further 194 returns from sampled contacts which indicated that the researcher was no longer working at the institution. Thus 1440 questionnaires were completed from 3196 sampled contacts – an effective response rate of 45%. The separate process to survey a postgraduate sample also resulted in 224 additional completed questionnaires, which were not added to the RAE derived sample, but analysed separately.

Comparison of the respondents with the original sample in respect of subject group, region and RAE rating showed that the profile of respondents matched that of the sample profile: there was little, if any, non-response bias in the achieved sample.

Analysis

The survey responses were analysed by discipline of research, based on 5 broad subject groups², in order to compare and contrast, in the first instance, any differences in patterns of use and behaviour between the disciplines.

The survey respondents were also divided into other sub-groups, such as age, percentage of time spent in research, working methods, RAE rating to identify differences where any exist.

The survey responses were also analysed by UK region, based upon the Government designation of English regions plus Scotland and Wales, and by other factors, such as age of home institution³, library spend per full-time equivalent (FTE) student in the home institution, and whether or not the home library is a member of the Consortium of University Research Libraries (CURL).

Profile of the survey respondents

Tables 1 and 2 summarise the profile of the 1428 researchers who completed and returned the questionnaires in the main survey. It excludes the 224 additional junior postgraduate researcher responses (see Samples and Response rate above).

² Medical and Biological Sciences, Physical Sciences and Engineering, Social Sciences, Area Studies and Languages, Arts and Humanities (defined in Appendix 4).

³ See section 6.4

INTRODUCTION

Table 1 shows responses in 5 broad subject groups and by respondents' age groups, percentage of time they spent on research, supervisory responsibility and whether they work in a team.

Table 1: Subject and individual profiles of the survey respondents

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Age						
up to 39	29%	36%	25%	27%	29%	29%
40-49	38%	28%	30%	26%	25%	30%
50-59	26%	24%	37%	36%	36%	32%
60>	5%	12%	8%	11%	10%	9%
Team work						
Works in a team	71%	57%	36%	7%	7%	41%
Does not work in a team	27%	41%	60%	91%	90%	57%
Supervision						
Supervises others	95%	93%	86%	83%	76%	87%
Does not supervise	4%	7%	13%	17%	24%	12%
Time for research						
Over 50%	39%	25%	22%	8%	12%	24%
Under 50%	58%	75%	77%	91%	87%	75%
Number of responses	315	316	424	123	250	1428

Table 2 divides the researchers by the location of their higher education institutions in the 9 regions of England, and Wales, Scotland and Northern Ireland.

Table 2: Regional and individual profile of survey respondents

	London	South East	South West	East	East Midlands	West Midlands	Yorkshire & Humberside	North West	North East	Wales	Scotland	Northern Ireland	All respondents
Age													
up to 39	21%	29%	41%	32%	24%	28%	28%	27%	35%	41%	33%	31%	29%
40-49	34%	33%	26%	23%	42%	32%	22%	29%	32%	22%	29%	31%	30%
50-59	31%	29%	30%	33%	28%	32%	42%	33%	26%	28%	29%	29%	32%
60>	12%	8%	4%	12%	4%	8%	7%	11%	7%	7%	9%	6%	9%
Team work													
Works in a team	39%	31%	45%	37%	40%	46%	38%	43%	29%	49%	52%	46%	41%
Does not work in a team	56%	66%	54%	62%	56%	54%	60%	56%	67%	50%	46%	54%	57%
Supervision													
Supervises others	89%	83%	86%	94%	90%	93%	86%	86%	81%	91%	84%	89%	87%
Does not supervise	9%	17%	14%	6%	9%	7%	14%	14%	18%	9%	12%	11%	12%
Time for research													
Over 50%	29%	16%	34%	29%	23%	19%	16%	17%	12%	31%	31%	25%	24%
Under 50%	69%	84%	65%	63%	76%	81%	82%	84%	86%	67%	68%	72%	75%
Number of responses	250	180	98	103	91	111	134	126	58	69	171	36	1428

Structure of the Report

This report is in two parts. The principal part is a narrative Summary of **Research Findings**, in which the key issues, conclusions and recommendations are presented and illustrated where appropriate with research data and evidence.

This narrative is supported by an Annex on **The Evidence Base**, which provides a detailed analysis of the survey returns, including data tables and charts for comparison of responses between broad subject groups and other sub-groups.

THE RESEARCH FINDINGS

The most significant findings of the research are summarised in this section to shed light on the broad issues and questions identified in the objectives of the Study (see Appendix 1), namely:

- What is the nature, range and volume of material that researchers in different disciplines require?
- What is the nature of access required and how do they currently use the material in their research?
- What are the implications for the research process of where materials are located and what achievable patterns of location and accessibility of information sources are optimal?
- How far do researchers currently access research materials on line, and what are the perceived advantages and shortcomings of accessing materials in this way?
- What is the relative significance of the Internet as a research tool?
- What evidence exists for probable changes in how researchers access and use research materials across the next decade?
- What is the extent of difference in needs and practice between identifiable subgroups of researchers, related to research discipline or to other factors?

The evidence of the research survey is the principal source of this summary and conclusions; relevant tables and charts derived from the data are included for reference. Pertinent comments from the focus groups are presented in text boxes and evidence emerging from RSLG Call for Evidence and the Literature Review is quoted or referred to where appropriate. Document references are included in Appendix 5.

1 Nature and range of material required by researchers

Researchers were asked in the survey to indicate what materials are essential to their research, what they use but do not consider essential, and what they do not use. Several interesting similarities and differences emerged between the broad subject disciplines. Table 3 indicates what percentage of respondents finds each kind of material essential in their research.

Table 3 percentage of respondents rating material as essential

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Printed refereed journals	98%	96%	97%	98%	84%	95%
Books & current publications	60%	77%	92%	98%	93%	82%
Bibliographic tools, abstracting & indexing services	82%	75%	67%	74%	56%	71%
Electronic journals & other electronic publications	73%	62%	57%	26%	22%	53%
Electronic full text services	75%	57%	56%	27%	24%	52%
Other printed non-refereed journals	19%	21%	38%	52%	46%	33%
Electronic pre-print archives	44%	45%	25%	12%	10%	30%
Computerised data sets	31%	28%	27%	12%	14%	25%
Photographs & still images	20%	16%	10%	23%	42%	20%
Newspapers	2%	2%	31%	34%	27%	18%
Rare books & MSS	3%	4%	9%	61%	49%	18%
Microfilm / microfiche	2%	3%	10%	51%	33%	14%
Moving images and / or sound recordings	9%	8%	5%	27%	22%	11%
Maps & charts	4%	7%	11%	10%	17%	10%
Artefacts	1%	4%	1%	6%	25%	6%

The indicated range and diversity of materials used by researchers in the different broad subject groups conformed in large part with the findings of both the literature review and the focus groups, with some interesting differences or significant indicators in three key areas: the use of books and printed journals, the importance of electronic journals, and the low use of non-text research materials.

1.1 Use of books and printed journals

“The first need for researchers in the humanities and social sciences is a full range of academic books and journals”⁴

The research shows that it is not only researchers in humanities and social sciences who require access to books: in the sciences at least two thirds of the respondents consider books to be **essential** to their research. A response to the RSLG Call for Evidence reinforced this in the comment “Medicine...is still reliant to some extent on research monographs; and, with the advent of evidence-based research, many of its component subjects require access to a massive volume of published literature, both old and new.”⁵

There is, however, little evidence in the literature to support the importance of books, which may reflect more an attitude towards writing about the role of books in research and the fact that this is not a topic in vogue in professional literature. Bell (1997) reviewed the literature to 1997 and found that a common theme in several studies was “the preference of academic researchers for familiar and well-established sources of information, in their own collections or libraries”, which this research certainly supports. She does not, however, specify that this means books.

The science researchers in the focus groups confirmed the continuing importance of book and other current publications to their research, in two ways:

- the importance of using books in researching new subject areas or themes; as ground-clearing research, a foundation for identifying and focusing on key issues;
- As reference and referral sources (e.g. on procedures in sciences).

Humanities researchers regard books as the most important sources of knowledge and information about other researchers work (e.g. in historical studies). In this context, the long time to press / publication for monographs was commented upon in the context of 'currency' of materials.

Perhaps less surprisingly, printed refereed journals are considered essential to their research by virtually all researchers. A significant proportion of researchers in Arts and Humanities and Area Studies and Languages regard non-refereed printed journals as essential. The advent and importance of electronic journals in the sciences, in particular, have clearly not yet reduced the importance of the printed journal.

One respondent to the RSLG Call for Evidence wrote: “Our consultation with researchers confirmed the view that those engaged in arts and humanities research will continue to rely heavily on printed material for many years, those in the social sciences for a considerable time and that even those in the STM area where electronic resources have made the most impact perceive an ongoing need for printed material.”⁶

⁴ RSLG Call for Evidence – British Association for American Studies.

⁵ RSLG Call for evidence – Russell Group

⁶ RSLG Call for Evidence – University of Birmingham

1.2 Importance of electronic journals and electronic information

“In Science and Technology subjects, leading-edge research is no longer dependent upon the research monograph, and the emphasis of need is largely focused on pre-prints, on specialised journal articles, research reports and abstracts, as well as on access to large dynamic databases of scientific and technological data.”⁷

From the research evidence Medical and Biological Sciences research is focused on journal literature and primary data; timeliness and speed are key factors, which make the use of these research sources and indexing tools in electronic formats increasingly attractive and essential to researchers.

Physical Sciences and Engineering research relies on a broadly similar range of primary data and secondary sources. Reliance on electronic formats and services appears to be slightly lower among the physical sciences, despite the fact that it is generally recognised that particle physics has led the way in electronic scholarly communication (Green 1998; Kling 2000). Kling (2000), however, posits that this behaviour is consistent with physicists’ pre-electronic pre-print culture.

In the Social Sciences electronic journals and other information sources appear to be of less importance than in the sciences, though this may reflect a smaller range of titles and data available in electronic formats. The Russell Group reported “in the Social Sciences, the needs largely sit astride ‘the hybrid divide’ between the electronic and the printed information world. Hard-copy research monographs, major printed information works, long back-runs of print-on-paper journals need to be consulted alongside electronic research databases, large data archives, and digital resources of every kind, including vastly expensive commercial information services.”⁸

Electronic journals and other electronic information sources are essential to considerably fewer researchers in Arts and Humanities, and Area Studies and Language.

The focus groups indicated that the relatively low levels of use of electronic journals in Arts and Humanities is a result of the lower numbers of relevant journal titles available in electronic form. The belief was expressed that the relatively small and specialist research communities served by individual journals, for instance in history, would militate against their conversion from print to electronic.

At least one university has observed “a growing demand among humanities and social sciences researchers for electronic access to archives of popular newspapers and non-academic periodicals”⁹

⁷ RSLG Call for Evidence – Russell Group

⁸ *Ibid.*

⁹ RSLG Call for Evidence – University of Stirling

1.3 Non-text research materials

A small but significant number of researchers in Medical and Biological Sciences and Physical Sciences and Engineering use photographs and still images. These are increasingly likely to be digital images used as part of research pre-print and published articles, or micrographic and computer images.

In one of the focus groups a Chemical Physicist said that his approach to research had not yet changed but “the advent of 3D images and the gradual ability to integrate images into research work will change the way individuals perceive their work and the way in which they collaborate.”

A similar level of use of still images is replicated among the Arts and Humanities and Area Studies and Language researchers, where the images are more likely to be surrogates (either digital, film or printed).

The focus groups emphasised the importance of images – both still and moving:

- in sciences and engineering for modelling and simulation
- in arts and humanities, area studies and languages as surrogates for objects, rare books and manuscripts where visual characteristics are important

It was noted (Arts) that low quality or pixelated images are often only of limited use (e.g. as finding or selection aids) and access to both high quality / high resolution images and to 'originals' is often required and should remain available.

Moving images and sound recordings are regarded as important by only about a fifth of researchers in the arts, humanities and area studies as yet, though there are indications in the research that this will change (see Table 10 in paragraph 5.1 below).

Surprisingly few researchers in Social Sciences, Arts and Humanities and Area Studies and Languages regard maps and charts and artefacts as essential to their research. This may in part arise from the perceived barriers to access to archival repositories and museum collections (see paragraph 3.3 below).

The focus group indicated high levels of importance of *artefacts* in art and design research. Going to see paintings and other objects (often in museums) is an essential part of research: exhibition catalogues are used as finding aids but for research purposes physical access is required.

2 Nature of access to research materials

For a predefined list of access and discovery methods, respondents were asked to indicate if they used these, and which ones they considered essential. Table 4 summarised the views on *essential* methods.

Table 4: Essential access and discovery methods for percentage of survey respondents

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Consult printed books or journals	91%	90%	93%	98%	96%	93%
Use inter library loans and/or document delivery	79%	65%	77%	86%	64%	74%
Search catalogues (online or card)	58%	66%	75%	87%	71%	70%
Use other library technology (photocopying, scanning, printing out etc)	62%	50%	58%	69%	69%	60%
Access online electronic books or journal articles	80%	69%	61%	36%	30%	59%
Browse through collections of books or other material	15%	24%	46%	69%	64%	40%
Consult primary materials	16%	16%	24%	62%	67%	31%
Use enquiry & research assistance	17%	15%	36%	39%	28%	26%
Consult surrogates?	3%	2%	10%	50%	36%	15%

Here the responses confirm similarities between the subject disciplines in the importance of inter-library loans / document delivery, of searching library catalogues (both of the home institution and other libraries) and of using library technology services. Interesting and significant differences relate to the importance of physical access to libraries and collections and the use of library services.

2.1 Inter-library loans and document delivery

Focus groups indicated some confusion among researchers about the terms 'inter-library lending' (meaning the borrowing of publications and documents from the British Library and other libraries) and 'document delivery' (meaning the provision of photocopies, faxed or electronic copies of published journal articles). From the researchers perspective these services, usually mediated through their home university library, appear undifferentiated and of equal value. Several critical comments were made in the Groups about the length of time it usually takes to acquire loans and photocopies through their own libraries.

Erens (1996) notes that "in general, the need for ILL appears to be steadily increasing over time, as the figures obtained in 1995 were very similar to those obtained in the 1989 survey".

Further evidence emerges from a study commissioned by the British Library to look at trends in the provision of science technology & business information (British Library,

1999). One of the key findings focussed on document delivery and the threats to the Document Supply Centre's business through "the electronic revolution, together with the emergence of competing physical document delivery systems". The consultants also speculate, however, that demand for loans of hard copy books and report literature could increase because of the high cost of books and the "increasing profile of social science research at government level".

2.2 Importance of physical access to libraries and collections

Guthrie (2001), in a study which explored how US academics perceived and used electronic resources, found that academics in the Humanities depend more on the library for access than social scientists and that more academics in Humanities thought it crucial for libraries to maintain hard-copy archives than in Social Sciences.

In this Study survey, researchers were also asked how important physical access to libraries is for their research. Twice as many researchers in Area Studies and Languages and Arts and Humanities consider physical access to libraries and collections essential to their research as their colleagues in the Social Sciences and over three times as many as researchers in the medical, biological and physical sciences. This correlates with the very wide diversity of physical materials required by researchers in these fields, in comparison to those in scientific fields and social sciences (see Table 3 above).

Browsing through collections of books and journals, and the serendipitous benefits this can bring to research, is also essential to twice as many Arts, Humanities, Area Studies and Language researchers when compared to their scientific colleagues (see Table 4 above).

2.3 The use of library services

Despite considering physical access to libraries non-essential, the great majority of researchers in Medical and Biological Sciences and Physical Sciences and Engineering do consider key library services essential – inter library loan and document delivery, and use of book collections – while over half also regard as essential the availability of online and card catalogues of collections and the use of library-based technology such as photocopying.

The focus groups indicated a strong Preference for access to printed copies as well as electronic access and clarified that, in the sciences at least, this is likely to mean printing out from an electronic information source, in order to have a printed copy. In arts and social sciences, this is more likely to indicate a perceived need to have print publications rather than electronic ones.

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Few scientific researchers consider the serendipitous benefits of browsing through print collections essential, from which it might be inferred that they obtain their required books through more focused search and discovery methods, through inter library loans or from other sources.

Researchers in Social Sciences, Area Studies and Languages and Arts and Humanities are significantly more likely to use research and enquiry services in their institutional libraries than their scientific colleagues. This clearly correlates with their relative reliance on physical access to collections and, in the case of the arts, humanities and area studies, with the diversity of physical research materials they require.

3 Location of research materials

Table 5 shows the diversity of research information providers in play among academic researchers in the UK.

Table 5: Percentage of respondents rating information providers as essential

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
(Home) university library	83%	83%	87%	86%	77%	83%
Own private collection	74%	74%	84%	91%	90%	81%
Colleagues / conferences / research networks	69%	73%	71%	65%	67%	70%
(Any) other university library	28%	24%	36%	72%	53%	38%
British Library	30%	30%	27%	66%	51%	36%
Departmental resources	40%	38%	31%	30%	26%	34%
Libraries / museums / archives outside the UK	5%	6%	16%	62%	41%	20%
Research institute(s) library	10%	8%	11%	20%	28%	14%
Other copyright libraries	10%	8%	14%	33%	20%	14%
(Home) university museum or archive	7%	7%	11%	22%	22%	12%
Public Record Office	2%	1%	11%	19%	26%	10%
National museums	2%	4%	4%	15%	28%	9%
Local record offices			5%	7%	16%	5%
National Library of Scotland	1%	1%	2%	11%	9%	4%
Local public library		1%	3%	5%	8%	3%
Local / regional museum	1%	1%	2%	5%	11%	3%
National Library of Wales	1%	1%	1%	4%	2%	1%

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These results show that the physical location of material is becoming a secondary issue to researchers in Medical and Biological Sciences and Physical Sciences and Engineering, as the widening range of essential research materials and data available electronically has an impact on research patterns in these fields. They also indicate the current high importance to researchers across all subject fields of resources in their own institution's library or their own collections.

Significant differences between subject groups appear in the importance of other university libraries in research and in the use of the British Library and other national research information providers.

3.1 Researchers' own and institutional resources

Erens (1996) found evidence that researchers are now making *less* [our italics] use of their home university library, with those in medical and natural science disciplines the most likely to say they now made less use of the library.

Ferguson and Crawford (2001) in their study of library use amongst researchers at Glasgow Caledonian University note that visits to the library are in decline and report a lack of awareness of what the library can and does provide, both on and off campus.

Contrary to these reported trends, the survey indicates that the overwhelming majority of researchers (83%) regard their own university library as essential to their research. This percentage of 'essential' responses is higher than for any of the other information providers named in the survey.

Researchers were asked to say how well their home university library meets their research needs. About a quarter, with very little difference across the subject disciplines, consider it meets them very well, and about half fairly well, so levels of satisfaction appear to be reasonably high. However, across all subjects, researchers comment on the need for better general or specific journal provision (either electronic or printed) as the primary area for improvement of their home university library services.

In one focus group there were some strong negative statements questioning the size of libraries in terms of building space, staff numbers and costs. All of the group members tended to talk about the library in the sense of physical building with physical holdings – and their visits to it (or not). There appeared to be very little understanding – or acknowledgement – that the library provided many of the electronic services they used, or could use, on and off site.

Erens (1996) reports declining levels of satisfaction with library provision between 1989 and 1995 and marked differences between the medical and natural science disciplines on the one hand, and the social sciences, humanities and arts on the other: "the former were more likely to say that they now relied less on browsing the shelves and more on photocopied material; the latter were more likely to say that they were less speculative when recommending library purchases, that their recommendations were refused more often, and that they used other libraries more often now".

The overwhelming majority of researchers, most particularly in Area Studies and Languages and Arts and Humanities, rely heavily upon their own private collections in research. The nature of these growing private collections, according to the focus groups, ranges from books bought from personal funds, printed journals received on subscriptions linked to membership of professional and other associations, collections of photocopied articles, downloaded electronic files held on disk and/or printed out, and collections of biological / botanical specimens.

"The library has lost its point. You need to take consumers back to the library or vice versa. Subject librarians need thorough training to teach other staff. The library is being run centrally but not well. It's no fun there any more... Librarians are never at their desks - I want my own librarian" (Accounting/Economics)

"What we need is people decentralised and collections centralised – subject specialist librarians are key. There's no longer a need for multiple holdings of collections – all universities need to have access to a central pool" (Chemistry)

"The Subject Librarian is key" (French); "the librarians in law are very good"(Law)

"The primary focus of the library is undergraduate teaching"

3.2 Use of other university libraries

More survey respondents in Area Studies and Language indicate that other university libraries are essential to them in comparison with colleagues in Arts and Humanities and Social Sciences. Relatively few of their colleagues in the sciences consider any other university library essential, which correlates with their views on the need for physical access to libraries and collections.

These findings are key with respect to the Distributed National Collection and the whole issue of access to research collections. Anderson (1998) reporting on a survey of postgraduate students and staff found that external access caused "about 20 institutions to incur additional library expenditure ...in excess of £100,000 per annum ...with the top five institutions each probably incurring additional costs of at least £500,000 per annum".

However, the CORSALL study (Bloor, 2001) found that the level of reciprocal use between three co-operating and locally situated university libraries was low. The main barriers to reciprocal use were summarised as "lack of knowledge about the reciprocal access arrangements, lack of knowledge of what was available at the other libraries, and lack of time". Other comments in the study included "it is rarely cost-effective for researchers to visit other libraries to consult material; it is usually more economical to obtain the material via inter-library loan". The CORSALL findings are significant in the light of the government's regional agenda and some further research into access at local and regional level is needed.

3.3 Use of the British Library and other national / regional providers

The survey indicates that the British Library is considered essential to research by over one third of researchers in all subject fields, and by over half of researchers in Area Studies and Languages and Arts and Humanities. What is not clear from these results is whether this indicates the essentialness of actual visits to the British Library or of its inter library loan and document delivery services.

The role of other national and regional providers of research information and resources – many of which are outside the higher education sector, such as the national museums – is not currently a particularly important one, even in Arts and Humanities. While a significant number of these researchers do use museums and archives, few regard them as essential to their research.

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Focus groups expanded on the problems associated with accessing materials in other libraries, museums and archives. While many non-scientists would make use of reciprocal access agreements in areas with multiple HE institutions - often essential for researchers at institutions with very limited or inappropriate local library resources - it was seen as both time and cost intensive to get (physical) access to primary materials in archives and museums.

The 'type' of access (e.g. mediated by curators) allowed to researchers is seen as a barrier. For some researchers microfilm or other surrogates provide adequate access to resources in archives and little need exists to have access to 'original' materials. It was also pointed out how difficult it is to know what exists in many archival repositories and museums. Time and cost are barriers to resource discovery

This finding is in contrast to the situation as viewed by some of the specialist libraries in the response to the Call for Evidence. For example, the Royal Institute of British Architects (RIBA) interpret their own use statistics to show that "UK universities are at present unable to meet the needs of their researchers. More than 50% of the use of the RIBA Library is by members of UK universities."

Also worth noting is the relatively small number of researchers, outside Area Studies and Language who regard the other copyright libraries as essential to their research.

4 Access to electronic information sources & services

Researchers were asked to indicate the importance of a range of search and discovery methods when using electronic information sources. Table 6 summarises the responses.

Table 6: Electronic sources: search and discovery methods rated 'very important' by respondents

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Online catalogues for your own institution's library	32%	33%	56%	68%	54%	46%
'Generic' web search engines	42%	48%	45%	49%	44%	45%
Bibliographic databases, abstracting & indexing services	60%	44%	40%	38%	29%	43%
Institutional or departmental gateways / portals	35%	31%	36%	32%	28%	33%
Subject gateways / portals (e.g. RDN)	26%	24%	27%	27%	21%	25%
Digital libraries / archives (e.g. MIMAS)	30%	38%	19%	11%	12%	23%
'Subject' mailing lists / alerting facilities	14%	10%	17%	15%	13%	14%
Personal portals	14%	11%	7%	6%	8%	9%
Pre-print archives	6%	16%	4%	7%	3%	7%

Clear similarities between the subject groups are indicated in relation to the use of 'generic' web search engines and subject gateways.

4.1 Web search engines and subject gateways

The Internet is clearly a significant and important research tool to all researchers, across all subject disciplines. Where use of electronic journals and information sources in research is relatively low, for instance, in Arts and Humanities because of the relatively few e-titles available, nonetheless researchers make use of web searches, electronic discussion lists and the web sites of particularly important organisations on a regular basis. This was confirmed in the focus groups and supported by almost half of respondents to the survey indicating how essential web search engines are.

Hewitson (2000) found that the favoured route to accessing electronic information sources was via gateways or search engines. He expresses concerns about this finding, in the fact that staff are missing out on the subscription based services accessible only via library or learning centre catalogues. This view is, tentatively, supported by the percentage of respondents rating web search engines 'very important' (45%), compared to Institutional or departmental gateways / portals (33%) – assuming that the latter are a reasonable proxy for the subscription based services Hewitson refers to.

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Kibirige and DePalo (2000) found that search engines provide the most common access points for library users to get to Internet resources on topical issues.

“One of the things I **miss** is the article I would have read because it’s not picked up by the search engine. I’m missing key stuff and serendipity. Some of the key articles are not on line but you forget that.” (Chemistry)

Results from the survey support this in indicating that twice as many researchers across all disciplines (just under half of all respondents) regard generic search engines (such as Yahoo or Google) as very important for accessing internet resources in comparison with mediated subject gateways or portals, including institutional gateways and those provided as part of the Resource Discovery Network (RDN).

In the focus groups there was concern about quality and provenance and, as a result, even some disparagement of information sources located through use of generic web search engines. However, almost everyone admitted to making frequent use of them.

Awareness of the mediated subject gateways was low, particularly in arts, humanities and area studies. Where focus groups members confirmed that they used subject gateways and portals there was some criticism of the choices made in establishing collection or content boundaries: “the gateway ... seems to point to a rather arbitrary selection of materials” and “the views of those who run them predominate in the choice of content”.

There was a feeling that electronic gateways constrained freedom of choice in a way that physical libraries do not and mixed feelings about increasing commercialisation. Comments included: “But the library sort of does this anyway”... “But the library was efficient”....“Libraries are run by committees”

In a significant body of the literature about subject gateways that comes from within the eLib / RDN projects, there is an assumption about the need for the gateways and other access tools which is not necessarily borne out by the research findings. Cross et al (2000) pose the question of how to make the World Wide Web a better tool for supporting the work of the research community in Europe. The question is key but the solution offered is technical and perhaps fails to address the more complex issues highlighted by this research: “By developing new Internet technologies and using them to create high quality online information services...the DESIRE project has demonstrated that Internet gateways built by qualified subject experts using standard Web technologies can offer Internet users unparalleled levels of quality when searching the Internet” (Cross et al, 2000).

Cole and McCombe (1998) address issues around researchers’ awareness of resources and their efficient use of time, but their solution again is technical: “For us this means creating appropriate interfaces for the data - simple enough for a once-off selection and versatile enough for more sophisticated use”.

4.2 Primary points of access to electronic resources

Researchers were asked what is their primary (i.e. most used) and secondary access point for electronic sources of research information.

The majority (80%) of all researchers have their primary desk-top access point in their office, though researchers in Arts and Humanities and Area Studies and Languages are significantly more likely to access electronic resources from home than those in the social and other sciences.

The focus groups indicated that this slight bias among scientific researchers to access electronic sources primarily from the workplace rather than from their home may partially be accounted for by a greater reliance in scientific disciplines on access to site licensed electronic journal and information services, and/or services which can only be accessed from restricted ranges of IP addresses.

Arts, Humanities and Area Studies researchers are more likely to be using Internet resources which are accessible from any computer. Compared to scientists and engineers, they also have more opportunity to conduct research from home, as they are less likely to be dependent on specific infrastructure in the workplace (e.g in a laboratory setting).

4.3 Perceived advantages and shortcomings of electronic access

Significant contrasts between the subject disciplines emerge from the survey questions on how easy it is to find, access and use information electronically compared to more traditional (non-electronic) means, as Table 7 shows.

Table 7: Finding, accessing and using information electronically: comparison with traditional, non-electronic means

	Medical & biological sciences	Physical Sciences & engineering	Social Sciences	Area Studies & languages	Arts & humanities	All respondents
Finding information electronically is a lot easier	83%	77%	65%	48%	48%	66%
Accessing information electronically is a lot easier	65%	57%	45%	32%	22%	47%
Using information electronically is a lot easier	50%	35%	31%	22%	17%	32%

These figures reflect the relatively lower levels of use and importance of electronic information sources among researchers in Arts and Humanities and Area Studies and Languages than among the science researchers. What is interesting is that, in all subject groups, fewer researchers think it is a lot easier to **access** information electronically than it is to **find** it, and even fewer think **using** electronic information is a lot easier than using traditional research materials.

Payment emerged as a barrier to accessing commercial electronic information sources in the focus groups, where researchers get as far as locating the information they require but are denied access unless an online payment is made.
 "There's this fear of being asked to pay – you run scurrying" (Chemistry)
 "I don't know about that [i.e. paying]. There's ProQuest, where you pay for PhD theses. Paying is not always a turn-off" (Earth Sciences)
 "We will get used to paying for things" (Engineering Mathematics)

Table 8 indicates strong agreement among non-science researchers with the need for access to printed copies as well as electronic. This corroborates the focus group views that everyone prints out electronic documents of any significant size if they wish to read them in detail.

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Table 8: Views on electronic sources of research information

	Medical & biological sciences	Physical Sciences & engineering	Social Sciences	Area Studies & languages	Arts & humanities	All respondents
Agree strongly that access to printed copies is needed as well as electronic	27%	33%	45%	57%	59%	42%
Agree strongly that better research can be done with online information sources	42%	36%	33%	27%	20%	33%
Agree strongly that there is less control over quality provenance of material	10%	17%	22%	40%	31%	21%
Agree strongly that some of the information I need is only available online	13%	11%	11%	5%	8%	11%
Agree strongly that there is too much information available online	8%	7%	13%	9%	15%	11%
Agree strongly that electronic databases make physical collections less important	15%	11%	7%	1%	4%	9%

Researchers in Arts and Humanities and Area Studies and Language are clearly more worried about the quality and provenance of the research information they find online. This is likely to arise from the relatively higher dependence among the arts, area studies and social sciences on use of unmediated Internet sources rather than the electronic journals and datasets available to researchers in the sciences.

4.4 Training, advice and guidance in using electronic sources

Hewitson (2000) notes that electronic indexes and abstracting services and electronic journals are not used frequently by staff. “This suggests that many staff are not fully aware of the different [electronic information services] that are available to support learning, teaching and research in their subject area.... This suggests that awareness raising and staff development by LIS should be focussed...”

Significantly, only a small proportion, less than one-fifth, of all respondents said they have received some training, advice or guidance in using computer-based research resources in the last two years. Even fewer researchers in Medical and Biological Sciences and Physical Sciences and Engineering have taken part in any training or been in receipt of any advice, and science researchers are less likely to seek for help, advice or guidance than those in arts, humanities and area studies. Table 9 indicates that over half of researchers either do not take-up training, advice and guidance when it is offered or are not aware that such assistance is on offer from their libraries.

Table 9: Incidence of those using help or advice offered by their own institution’s library staff

	Medical & biological sciences	Physical Sciences & engineering	Social Sciences	Area Studies & languages	Arts & humanities	All respondents
Yes, advice sought from library staff	18%	17%	24%	28%	22%	21%
Yes, advice, course, updates made available by staff	9%	7%	16%	20%	14%	13%
No, none offered	11%	12%	8%	10%	15%	11%
No, offered but not used	36%	40%	34%	33%	28%	35%
Don't know if help/advice is available	23%	18%	14%	9%	15%	17%

One of the validation focus groups was dedicated to issues of training, advice and guidance. It proved difficult to get the Group to talk about their own training needs and they consistently side-stepped the issue, as if their own training was not a pertinent topic – or something they were not willing to share with the group.

Some typical focus group comments on training and awareness:

“There’s a big difference between information sourced from the web and that from refereed journals but students are not being taught how to distinguish”

“I don’t come into this category” [of needing advice or training] (Earth Sciences)

“Training wise I’m completely up-to-date. The subject librarian comes in and cascades training” (Pharmacy)

“I learnt from colleagues; we run courses for undergrads; we train postgraduates but then what they learn is a subset of what I know “(Evolutionary Computing)

“The thing about electronic resources is that we can pretend to be very good very quickly – but lack depth.” (Mathematics)

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With regard to mediated subject gateways 'I feel I need to know more than I do' was almost a consensus view, and a similar lack of awareness was demonstrated with regard to access to on-line newspapers.

It also became apparent that use of the term 'training', in connection with raising awareness of electronic sources and up-dating skills, was regarded negatively by the group. Despite the perception clearly stated that training was not required, at other stages of the focus group discussion it became apparent that *awareness* of aspects of e-sources was variable.

In the survey, a significant majority of respondents, having registered largely negative views on training, advice and guidance, nonetheless display a remarkable degree of unanimity across the disciplines when asked to rank a list of possible things they might like to know more about. The most votes were given to:

- Specialist online search skills
- Ways of keeping up-to-date with what is available
- Locating high-quality information sources
- How to filter online information effectively
- How to find / create online archives
- To find out what resources are available through their own university

There was concern expressed by a minority of researchers in the focus groups at a lack of e-skills:

"IT came upon us – we manage as best we can, but we are not properly prepared, trained or ready." (Social Sciences)

In general, the focus groups indicated that researchers do have appropriate skills but need more support (tools and information specialists). Some researchers suggested that query formulation and database interrogation skills are becoming increasingly important.

"I work with librarians - do the shallow searches myself... but am not very good at keyword searching"

5 Probable changes in access and use of materials

The survey results suggest that researchers have, on the whole, a very conservative view of their future research requirements and methods: the large majority in all subject groups anticipate few changes in the current situation. Some indication of expected change emerges in three key areas: the use of research materials and sources, the use of research information providers, and access and discovery methods.

5.1 Use of research materials and sources

There are few surprises in the researchers expectations of which research materials they are likely to use more in the next 10 years, as Table 10 shows.

Table 10: Research materials that will be used more by percentage of survey respondents

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Electronic journals & other electronic publications	84%	80%	76%	60%	57%	74%
Electronic full text services	79%	74%	68%	47%	53%	67%
Electronic pre-print archives	68%	65%	51%	38%	45%	56%
Bibliographic tools, abstracting & indexing services	59%	48%	43%	28%	29%	44%
Computerised data sets	44%	39%	31%	23%	27%	34%
Electronic alerting services	45%	35%	36%	20%	20%	34%
Electronic bulletin boards	31%	24%	29%	29%	20%	27%
Electronic discussion lists	25%	25%	27%	16%	25%	25%
Moving images and / or sound recordings	27%	22%	16%	18%	17%	20%
Printed refereed journals	11%	12%	20%	15%	26%	17%
Photographs & still images	18%	12%	14%	16%	21%	16%
Books & current publications	8%	10%	18%	15%	23%	15%

A majority of all researchers, irrespective of their subject area and their current research requirements, foresee that they will use secondary research information sources in electronic format more than they currently do.

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The focus groups shed some light on the accelerating move towards electronic formats and electronic access to research materials:

- In the humanities, the overall impression is that researchers do not believe that, at present, a critical mass of relevant materials is available electronically. They are very interested in increased availability of e.g. of electronic full texts of manuscripts and primary documents.
- Scientists and engineers rely heavily on electronic access and expect this to increase even more.
- It was noted by several arts and humanities participants there is as powerful tradition and 'culture' of physical contact with objects, manuscripts etc. "touch and smell does matter!"
- The concept of serendipity was seen as one of value to research but easily lost with an increased move to electronic access - "browsing is different and more difficult electronically"
- The potential strength of electronic access in terms of 'anywhere, anytime' was recognised across all subjects.

Of interest also is the view taken by one quarter of Medical and Biological Sciences respondents that they will use moving images [and/or sound recordings] more in future – an indication of the increasing importance of digital micrographic and computer modelling in primary research.

The survey results do not appear to support the view expressed by the British Association of Japanese Studies in the RSLG Call for Evidence that "it can also be expected that the research fields will become more interdisciplinary, with the pressures of the RAE, and the increasing globalisation of scholarship, leading to research being pursued by more international or global groups of researchers, so more research activities will become joint projects or cooperative studies and will involve UK researchers with Japanese, European and North American researchers. With this trend in mind, it can be expected that libraries will be called on to provide more original or primary research materials".

When asked to consider what research materials they might use less in future the only significant response was that about one third of Medical and Biological Sciences and Physical Sciences and Engineering researchers expect to use printed refereed journals less than they do now. This not unexpected response contrasts with the converse view taken by one quarter of respondents in Arts and Humanities, who expect to make **more** use of printed refereed journals..

5.2 Use of research information providers

Respondents were asked to indicate, for each information provider on a list, to indicate envisioned change of use. Very few respondents to the survey foresee any change – either increase or decrease in use - in the range of information providers they currently use. Table 11 summarises significant anticipated increased use.

Table 11: Percentage of respondents that expect to use the information provider *more*

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Colleagues / conferences / research networks	24%	23%	22%	15%	25%	23%
(Home) university library	16%	18%	17%	12%	19%	17%
(Any) other university library	12%	14%	18%	20%	24%	17%
British Library	11%	13%	16%	23%	28%	17%
Own private collection	12%	15%	16%	14%	24%	16%
Libraries / museums / archives outside the UK	5%	6%	12%	25%	29%	13%
Research institute(s) library	10%	6%	8%	9%	16%	10%
Departmental resources	11%	10%	8%	7%	10%	9%
Public Record Office	3%	1%	9%	9%	16%	7%
Other copyright libraries	5%	5%	7%	10%	10%	7%
National museums	1%	1%	4%	8%	14%	5%
(Home) university museum or archive	1%	2%	5%	7%	10%	4%
Local record offices	1%	1%	3%	2%	10%	3%

About one quarter of Arts and Humanities and Area Studies and Language researchers expect to make more use of libraries, archives and museums outside the UK, although considerably fewer respondents, overall, expect to make more use of museum and archive resources or the copyright libraries in the UK. The British Library, however, can expect a modest increase in use of its services and resources.

5.3 Changes in access and discovery methods

The results of the survey here bear out the overall perception among all researchers that the future is electronic. Table 12 summarises what access and discovery methods respondents think they will use more in their research.

Table 12: Percentage of survey respondents

	Medical & Biological Sciences	Physical Sciences & Engineering	Social Sciences	Area Studies & Languages	Arts & Humanities	All respondents
Access online electronic books or journal articles	78%	74%	66%	53%	51%	67%
Use inter library loans and/or document delivery	30%	27%	32%	31%	32%	31%
Search catalogues (online or card)	34%	35%	31%	19%	24%	30%
Use other library technology (photocopying, scanning, printing out etc)	17%	16%	24%	25%	30%	22%
Use enquiry & research assistance	10%	12%	20%	14%	14%	14%
Consult printed books or journals	7%	11%	12%	11%	18%	12%
Consult primary materials	3%	4%	7%	9%	23%	9%
Browse through collections of books or other material	4%	3%	8%	9%	14%	7%
Consult surrogates	2%	2%	5%	12%	12%	5%

Of particular interest is that one third of researchers expect to make increased use of inter-library loans and document supply, and also library catalogues, perhaps signalling the growing importance of sourcing and obtaining materials remotely from distributed collections.

6 Regional and resource differences

The analysis of the survey data according to different sub-groups (see Introduction: Research Methodology above) was expected to throw up some interesting contrasts between the views of the respondents in different age groups, from different regions and from different types of HEI. In fact, very few significant variations in responses were identified. Lack of variation in several sub-groups – regional groups, age groups and CURL and non-CURL member institutions - is almost as interesting as distinct differences. Some significant variations can be seen in responses from researchers in different types of institution, and in those with different levels of library spend.

6.1 Regional groups

Contrary to some assumptions made at the beginning of the research process, there are few significant differences in responses from the 9 regions of England¹⁰, Wales, Scotland and Northern Ireland.

Researchers in London appear to be no more inclined to consider national and other research resource providers outside the higher education sector as essential than researchers in any other region – not even the British Library. On the other hand, significantly more researchers in Yorkshire & Humberside and the North East region than in any other region consider the British Library essential to research – which is likely to be linked to the proximity of the British Library Document Supply Centre at Boston Spa.

One quarter of all the survey respondents think their own university library meets their research needs very well. Levels of satisfaction with their home university library are slightly higher than this among researchers in London; higher in the North East and significantly higher in the East Midlands.

6.2 Age groups

No significant differences were found among the age groups in the types of research information sources and information providers used currently or anticipated for future use.

It was assumed that differences would emerge in attitude to and aptitude with electronic information sources and these assumptions were confirmed, though the variations between age groups are not as wide as anticipated, and the age group 50 – 59 appear to be more at ease with research using electronic information sources than had been previously assumed.

6.3 CURL membership

There are no significant differences in any question areas in the returns from respondents in institutions whose libraries are members of the Consortium for University Research Libraries (CURL) when compared to those from non-member institutions.

6.4 Type of HE institution / library spend

Sub-groups were devised based on date of creation of the universities from which researchers' responses were received – pre-1962, 1962-1991, post-1992 - and whether the institution is an HE college. This categorisation is employed to reflect the two stages of university expansion in the latter part of the 20th century: the creation of

¹⁰ London, South East, South West, Eastern, East Midlands, West Midlands, Yorkshire & Humberside, North West, North East

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the 'Robbins' and 'Technology' universities in the 60's to 70's and the abolition of the binary divide in the 1990's. We assumed that the large research collections of many pre-1962 universities would have implications for researchers' use of, and attitude towards, their home university libraries.

The only significant variation in responses from each of the three groups of universities is indeed in the use of researchers' own home university library and other university libraries. Significantly more researchers in the Pre-1962 group regard their own university library as essential. Similarly, high levels of satisfaction with their own university library appear to be more prevalent among researchers in the pre-1962 group, than among those in the other two groups.

Because institutional library spend per FTE (obtained from SCONUL¹¹) correlates so closely with type of university (see Table 13) it is no surprise to find that views of the importance and effectiveness of their own university libraries are very similar among researchers in the high library spend institutions to those in the pre-1962 universities.

Table 13: Library spend per FTE by type / age of home university of respondents

	Pre 1962	1962-1991	Post 1992	All respondents
Low spend	11%	39%	80%	29%
Medium spend	32%	46%	9%	30%
High spend	46%	12%	2%	31%
Not available	11%	3%	10%	10%

¹¹ Standing Conference of National and University Libraries

7 Conclusions and recommendations

Here we draw a number of key conclusions from the research and indicate critical areas in which further research might be recommended or action taken.

The Study suggests that there are still significant differences in research requirements and behaviour between the subject disciplines, and supports the comment in the Call for Evidence that “the needs of researchers in individual disciplines are still distinct but developing interdisciplinary research and the use of ICT are blurring the boundaries”¹².

These differences are still particularly apparent in three areas:

- diversity of required research materials and research resource providers;
- continued importance of physical access to research resources;
- requirements for mediated information and library services, including skills and awareness-raising activities related to finding and using electronic information.

Further conclusions relevant to all subject groups emerge on

- increasing importance of remote resource discovery and retrieval of physical research resources;
- low levels of use and awareness of research resources outside the higher education sector;
- effectiveness of mediated subject gateways and portals as a means of accessing electronic research resources.

7.1 Diversity of required research materials and their providers

Arts and Humanities and Area Studies and Languages research draws upon a very wide and diverse range of research resources and providers, though for the large majority of researchers only books and printed journals are of high importance. This appears to reflect a relative fragmentation of research into small, highly specialised areas, for which primary research materials remain essential, and available only through the occasional use of a wide range of research resource providers.

This diversity and range of needs is also reflected in the results from Social Sciences researchers, though the importance of electronic information sources (particularly primary data) is having an impact on research patterns.

The increasing availability of primary and secondary research sources in electronic formats is transforming research in Medical and Biological Sciences and Physical Sciences and Engineering. Two trends are apparent: first, although electronic sources can technically be accessed from any location, researchers are highly dependent upon their own institutions’ libraries and their ability to fund and provide the appropriate and increasing range of electronic information sources.

Second, researchers in sciences who continue to need access to physical materials such as books are likely to build up reasonably extensive departmental or private collections of essential reference material, and rely heavily upon the inter-library loan services offered by their own institutions’ libraries. The use and importance of any other research information providers is relatively low.

7.2 Continued importance of physical access to research resources

The ‘culture’ of research was invoked by several focus group members from Arts and Humanities and Area Studies and Language to explain the importance of physical

¹² RSLG Call for Evidence-University of York

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access to, and in some cases, handling of primary research material – particularly archival sources, works of art and design and manuscript materials.

More generally, the Arts and Area Studies share with the Social Sciences a strong emphasis on the importance of physical access to libraries and collections, to browse and to take advantage of association and serendipity. Perceived barriers to accessing research collections in other locations, such as the time it takes to get there, the relative costliness of travel, and non-transparent access arrangements with other institutions, have no apparent impact on researchers' conviction that physical access to materials will remain essential.

This correlates with a relatively relaxed attitude to currency in research which is not shared by researchers in Medical and Biological Sciences and Physical Sciences and Engineering, for whom the need for physical access to libraries and research resources has been advantageously reduced by the availability of electronic information sources and primary data in electronic form.

We recommend that further research is carried out to overcome perceived (and real) barriers to physical access **targeted in particular** at the Arts, Humanities, Area Studies and Social Sciences. This could include consideration of different economic and infrastructural models, such as moving materials to researchers rather than researchers to materials.

7.3 Requirements for mediated information and library services

The research indicates that, as the requirements for research materials in different subjects increasingly diverge between the sciences and the arts, so too does researchers' use of the available library services in different subject fields.

The use of enquiry and research assistance from library staff remains important in Arts and Humanities and Area Studies and Language, but not so important to researchers in the sciences. For these researchers such assistance may be linked with the clearly negative views about training, advice and guidance on using electronic research sources.

"Maybe there's a need for a researchers' course – but not from the library. The library is useful for books" (Management)

"The response of the librarian should be to facilitate access to all kinds of information and services. I need training in knowing what I need training in. We need librarians who are evangelists. People who will say: "Did you know about...?" " (Engineering Mathematics)

Academic library services are failing to deliver the right kinds of training, advice and guidance to researchers on finding, accessing and using electronic resources. Not only that, but researchers are often unaware of existing advice and guidance opportunities, the existing interventions are not being delivered in the most appropriate ways, at the optimum times and by the most effective people.

We recommend that a detailed review and needs analysis exercise be carried out in the area of skills up-grading and awareness-raising for researchers, applicable and transferable throughout the higher education sector.

Library services, including inter library loan and document delivery services are of high importance to all researchers, but the need for timeliness and speed in scientific research appears to be often undermined by the slowness of response and results from centralised services.

We recommend that a detailed and critical review of the appropriateness of library

services be carried out in the light of the current and changing requirements of researchers. Services should be reviewed from the perspective of research requirements among the different subject disciplines, and not from the viewpoint of academic library managers.

7.4 Importance of remote resource discovery and retrieval

The research clearly indicates the continued and increasing importance of searching online and card catalogues of library holdings for researchers in all subject disciplines. This is linked, as resource discovery, to the increasing use of inter library loans, and to the continuing importance of books and other printed materials in research in all subject fields.

There are two conclusions to draw from this. First, for all researchers the importance of comprehensive online catalogues of nationally distributed research holdings is paramount, linked to efficient, fast and effective inter library loan and document delivery services.

Second, for researchers in Arts and Humanities, Area Studies and Language and Social Sciences, it seems imperative that those online catalogues should extend beyond the catalogue records of printed materials held in higher education sector institutions. The research indicates that non-conventional research resources, perhaps marginal to the scope and knowledge of many academic librarians, such as still and moving images, broadcast materials, maps and charts, have a very low profile among academic researchers. Given the richness of these kinds of resources nationally, for instance, in film at the British Film Institute, it seems imperative that this kind of material is brought within the conventional resource discovery and retrieval infrastructures of research.

7.5 Research resources outside the higher education sector

“Libraries, archives and museums contribute substantially to the growing corpus of digital information that scholars use...Strategic interventions which aim to encourage higher education’s exploitation of IT need to take account of the shared investment in and influence over the scholarly information landscape.” (Greenstein and Porter, 1998)

The Study does not confirm the importance to researchers of libraries, archives and museums outside the higher education sector. On the contrary it seems likely that national museums and archive services will be disappointed to see how low their profile is with researchers, even in Arts and Humanities. While it is true that increasing digital access to research information in these institutions is likely to have a very positive impact – one thinks of the Public Record Office’s recent initiatives – barriers to resource discovery in archives and museums (i.e. lack of comprehensive, online catalogues) and to physical access to the materials appear to be the two major hurdles to overcome.

We recommend that more work needs to be done by the non-HE research resource institutions in promoting their collections and services to academic researchers – perhaps through academic libraries. This is an area that would benefit from further research to identify where the main constraints lie and what promotional and awareness-raising models might be appropriate.

7.6 The effectiveness of mediated subject gateways and portals

The case for mediated subject gateways and portals – both national, such as the Resource Discovery Network, and institutional – has clearly not been made convincingly to researchers across all subject fields. It also appears that many

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researchers are simply unaware of the existence of mediated subject gateways.

This conclusion, we recommend, should prompt careful consideration by JISC and others in the HE research community of how the higher education and research gateways, portals and other electronic resource discovery tools are conceived, structured, delivered and promoted to researchers.

THE EVIDENCE BASE

Here we report on the detailed outcomes of the survey related to what research materials are used, which information and service providers researchers use, and what patterns of research and working methods can be identified.

Section 1 presents an analysis of responses on Research Sources, Materials and Methods among the 5 broad subject groups represented in the survey responses: Medical and Biological Sciences, Physical Sciences and Engineering, Social Sciences, Area Studies and Languages, and Arts and Humanities. At the very end of this section, key survey results have been brought together in 5 tables, to underpin and support the preceding text.

Section 2 covers data on Research and Electronic Sources of Information. Here significant differences between respondents in the broad subject groups are highlighted where they occur.

Section 3 reports on a number of other Patterns of Research Behaviour among sub-groups of the respondents, identified through analysis of the data by individual and institutional characteristics, such as age, amount of time spent in research, age / type of institution, amount of institutional library spend per FTE, RAE rating.

1 Research Sources, Materials and Methods

1.1 Medical and Biological Sciences

315 respondents to the survey are engaged in research in the Medical and Biological Sciences.

1.1.1 Research sources in medical and biological sciences

Primary sources

Computerised datasets of primary research data are the principal primary sources for medical and biological sciences research: 31% of respondents considered such data as essential to their research and a further 24% use these datasets. 44% of respondents believe that their use of such datasets will increase.

Images are important primary sources of information: 20% of respondents think still images are essential and a further 30% use them in their research. 9% of the respondents from Medical and Biological Sciences research regard moving images and / or sound recordings as essential and a further 22% use them in their research. This is likely to represent the use of digital micrographic images. 27% believe that they will use moving images and / or sound recordings more in future.

Secondary sources

Printed refereed journals are considered to be essential research tools by 98% of the respondents in medical and biological sciences, however, 35% of respondents believe that, though printed journals are currently essential, they will use them **less** in future. 19% of respondents also regard other printed, non-refereed journals as essential.

Currently 73% of the respondents regard electronic journals and other electronic information services as essential and a further 22% use such resources. 84% of the respondents expect to use electronic journals more

The growth in importance of electronic pre-print archives particularly to scientific research is reflected in the survey responses. 45% of respondents in Medical and Biological Sciences consider pre-print archives of journal articles to be essential and a further 30% use them. 68% of respondents expect to use pre-print archives more in future.

Of all the survey respondents 82% consider books and other current publications to be essential to research. In Medical and Biological Sciences this figure falls to 60%; a further 39% of respondents do use books in their research but do not consider them essential, but 16% of respondents think that they will use books **less** in future.

The high importance of journals (printed and electronic) and published books underpins high levels of use of bibliographic tools, indexing and abstracting services. Researchers in Medical and Biological Sciences accord them the highest importance – 82% of the respondents regard them as essential, and 59% of respondents believe their use of these bibliographic and indexing tools will increase. Electronic full text services, providing researchers with access to text as well as abstracts and bibliographic citations, are regarded as essential by 75% of Medical and Biological Sciences, while 79% expect these services to be used more in future.

Other sources of research information

Around 40% of respondents routinely use electronic bulletin boards and discussion lists in their research but do not regard them as essential. However, electronic alerting services are used by 43% of the Medical and Biological Sciences respondents and considered essential to their research by a further 21%. 45% of respondents expect to use electronic alerting services more in future.

1.1.2 Finding medical and biological science materials

Internal and external provision

Among the respondents a high degree of concentration on using local providers of information is evident. 74% of respondents rely on materials in their own essential private collections, and a further 17% use them. 82% of the respondents regarded their own university library services as essential, and 39% their own departmental resources. This no doubt reflects a high level of end-user access to electronic journals, datasets and other sources of electronic information.

Only 28% of respondents regard any other university library as essential, 42% use at least one university library other than their own institution, and 29% do not use any at all.

Of all other national and local library, museum and archive service providers, only the British Library is significant to Medical and Biological Sciences research, being cited as essential by 30% of the respondents and used by a further 24%.

69% of respondents consider conferences and networking with colleagues to be essential to their research and 23% believe that these will become more important to their research in future.

Attitudes towards their home university library services

Of the respondents 19% think that their own institution's library meets their needs very well; 53% fairly well and 23% not very well. Researchers were asked to comment on ways in which the facilities and services of their libraries could be improved or expanded to meet their research needs. Of the Medical and Biological Sciences respondents, 49% want improved online services and remote access to a range of electronic information services; 16% want a better range of reference books and journals generally, and 15% want better coverage of specific types of journal.

Constraints on access to materials

Researchers were asked what difficulties, if any, they have using other libraries. The respondents in Medical and Biological Sciences 'time to get there' (54%), 'charges for use, or other additional costs' (25%) and 'problems with rights of access' (25%) as significant problems.

Physical access v. online access

Only 26% of the Medical and Biological Sciences respondents think that actual physical access (not online access) to any libraries is essential for their research. Of these, 57% expect that to remain the same over the next 10 years and 31% believe that physical access to libraries will become less important to them.

A larger number of respondents (38%) think that physical access is fairly important to them now. Of these, 31% believe it will remain the same, and 63% expect physical access to decline in importance to them.

1.1.3 *Research methods in medical and biological sciences*

Priority research methods

The survey results indicate the following discovery and access methods are priorities (in order of importance) among Medical and Biological Sciences respondents; the figures in parentheses give the percentage of respondents who regard the method as **essential** to their research:

- Consulting books and journals (91%)
- Accessing online electronic books and / or articles (80%)
- Using other library technology, such as photocopying, scanning and printing out (62%)
- Using inter-library loans (61%)
- Searching catalogues, online and card catalogues (60%)
- Using enquiry and research assistance (17%)
- Consulting primary materials (16%)
- Browsing through collections of books / other materials (15%)

Respondents expect to do more searching of catalogues. The majority (78%) of respondents expect their need to access online electronic books and journal articles will be an even greater priority.

1.2 Physical Sciences and Engineering

316 respondents to the survey are engaged in research in the Physical Sciences and Engineering.

1.2.1 Research sources in Physical Sciences and Engineering

The survey asked researchers, which, of a list of information sources, they currently find essential, or use without being essential, or do not use in their research, and how levels of use might or might not change over time.

Primary sources

Computerised datasets of primary research data are important primary sources for Physical Sciences and Engineering research: 28% of respondents considered such data as essential to their research and a further 23% use these datasets. 39% of respondents believe that their use of such datasets will increase.

Images are important, though less so than in Medical and Biological Sciences: 16% of respondents think still images are essential and a further 22% use them in their research. 12% of respondents regard moving images and / or sound recordings as essential in their research. 22% believe that they will use moving images and / or sound recordings more in future.

Secondary sources

Printed refereed journals are considered to be essential research tools by 96% of the respondents in Physical Sciences and Engineering, and 20% also consider other printed, non-refereed journals to be essential. 27% of respondents believe that, though printed journals are currently essential, they will use them **less** in future.

Currently 62% of the respondents regard electronic journals and other electronic information services as essential and a further 31% use such resources. 80% of the respondents expect to use electronic journals more.

The survey indicates that the use of electronic pre-print archives is currently slightly higher among respondents than in Medical and Biological Sciences: 45% consider pre-print archives to be essential and a further 36% use them. 65% of respondents expect to use pre-print archives more in future.

Within Physical Sciences and Engineering respondents 77% consider books and other current publications as essential to their research and a further 22% routinely use books in their research, and the majority of those respondents expect no change in this over the next decade.

As in Medical and Biological Sciences, researchers in Physical Sciences and Engineering accord bibliographic, indexing and abstracting tools high importance – 75% of the respondents regard them as essential.

Electronic full text services, providing researchers with access to text as well as abstracts and bibliographic citations, are regarded as essential by 57% of respondents in Physical Sciences and Engineering. 42% of respondents believe their use of bibliographic and indexing tools will increase, and 74% expect electronic full-text services to be used more in future.

Other sources of research information

Around 35% of respondents in Physical Sciences and Engineering routinely use electronic bulletin boards and discussion lists in their research without regarding them

as essential. However, electronic alerting services are used by 45% of respondents and considered essential to their research by a further 11%. 35% of respondents expect to use electronic alerting services more in future.

1.2.2 *Finding Physical Sciences and Engineering materials*

The survey asked researchers which information providers they regarded as essential and which they use additionally or do not use. The respondents were offered a list of providers, both internal and external to their own institution, and asked them to comment on any difficulties or constraints on gaining access to the material they need.

Internal and external provision

Like their colleagues in Medical and Biological Sciences research, the respondents in Physical Sciences and Engineering regard as essential their own private collections (74%), their own home university libraries (83%) and their own departmental resources (38%).

Only 24% think that any other university library is essential to their research, while 42% do use at least one other, and 32% use none at all. 14% expect to be using other university libraries more in future.

The British Library is the main external source of research materials, considered essential by 30% and used by a further 22% of respondents. 24% make some use of other copyright libraries.

Networking with colleagues and attending conferences are considered essential to their research by 73% of the respondents. 23% believe that conferences and contacts with colleagues will become more important to their research in future

Attitudes towards their home university library services

Of the respondents 27% think their own institution's library meets their research needs very well, 48% fairly well, 19% not very well and 5% are clearly very dissatisfied with their library. When asked to comment on how the facilities and services might be improved, respondents in Physical Sciences and Engineering share similar views to their other scientific colleagues: 35% want improved online services and remote access to a range of electronic information services, 24% want a better range of reference books and journals generally, and 17% a better range of specific types of journals.

Constraints on access to materials

Researchers were asked what difficulties, if any, they have using other libraries. The respondents in Physical Sciences and Engineering cite 'time to get there' (47%), 'charges for use, or other additional costs' (16%) and 'problems with rights of access' (17%) as significant problems.

Physical access v. online access

32% of respondents think that physical access (rather than online access) to libraries is very important in their research: of these 12% believe it will become more important in future, while 63% expect its level of importance to remain about the same, and 23% expect physical access to become less important to them.

A larger percentage - 42% - think physical access is fairly important, and of those 40% expect that to remain the same, and 55% expect physical access to decline in

importance to them.

1.2.3 *Research methods in Physical Sciences and Engineering*

Priority research methods

The survey indicates a similar pattern of research discovery and access methods as in Medical and Biological Sciences: the following priority list includes percentage of respondents who regard each method as **essential** in parentheses:

- Consulting books and journals (90%)
- Accessing online electronic books and / or articles (69%)
- Searching catalogues, both online and card (66%)
- Using inter-library loan services (52%)
- Using other library technology, such as photocopying, scanning and printing out (50%)
- Browsing through collections of books or other materials (24%)
- Consulting primary materials (16%)
- Using enquiry and research assistance (15%)

The majority (73%) of respondents expect access to electronic information books and journal articles to become an even greater priority.

1.3 Social Sciences

424 survey respondents are engaged in Social Science research.

1.3.1 Research sources in Social Science

Primary sources

Computerised datasets of primary research data are essential principal primary sources for 27% of respondents in Social Sciences research, and a further 24% use such data. 31% of respondents believe that their use of such datasets will increase.

Other primary data used in Social Sciences research include maps and charts, considered essential by 11% of respondents and used by a further 14%.

Photographs and still images are considered essential primary sources by only 10% of respondents, though 29% use them in their research.

Secondary sources

Printed refereed journals are considered to be essential research tools by 97% of the respondents in Social Sciences; 38% also regard other printed, non-refereed journals to be essential and a further 50% use such sources. 20% of respondents believe that they will use printed refereed journals **more** in future.

Currently 57% of the respondents regard electronic journals and other electronic information services as essential and a further 34% use such resources. 75% of the respondents expect to use electronic journals more in future. Only 25% of Social Sciences respondents currently consider pre-print archives of journal articles to be essential, though a further 32% use them and 50% of respondents expect to use pre-print archives more in future.

92% of the respondents consider books and other current publications to be essential; 31% regard newspapers as essential in their Social Sciences research, and a further 44% use newspapers.

Bibliographic tools, indexing and abstracting services are considered essential by 67% of Social Sciences respondents, and used by a further 22%. Electronic full text services, providing researchers with access to text as well as abstracts and bibliographic citations, are held in similarly high regard as in scientific research: 56% of respondents regard them as essential while a further 28% use them. 43% of respondents in Social Sciences believe their use of bibliographic and indexing tools will increase, and 68% expect electronic full-text services to be used more in future.

Other sources of research information

Around 35% of respondents routinely use electronic bulletin boards and discussion lists in their research without regarding them as essential. However, electronic alerting services are used by 40% of the Social Sciences respondents and considered essential to their research by a further 13%.

1.3.2 Finding Social Science materials

Internal and external provision

Social Science respondents indicate a reliance similar to their scientific colleagues on

local providers of information: 84% consider their own private collections of material essential, and for 87% of respondents their home institution's library is essential to their research. Departmental resources are essential to 32%, used by a further 36%.

36% of respondents consider at least one other university library to be essential, and a further 45% use other academic libraries. 18% expect to be using these libraries more in future.

For Social Science respondents the British Library is the other most significant external provider of research materials and information – 27% consider it essential, and 29% use its services. 16% expect to use the British Library more in future. In addition, 30% of the respondents make some use of other copyright libraries, which are essential to just under half of this group.

71% regard networking with their colleagues and conference attendance as essential. 22% believe that conferences and contacts with colleagues will become more important to their research in future.

Attitudes towards their home university library service

Of the Social Sciences respondents, 27% think that their home university library meets their research needs very well; 53% are fairly well satisfied, and 16% feel they are not very well satisfied. Key improvements emerging from respondents' comments are a better range of reference books and journals generally (27%), online services and remote access to a range of electronic information (24%), and a better range of specific types of journals (16%).

Constraints on access to materials

Researchers were asked what difficulties, if any, they have using libraries and research information providers other than their own. In common with scientific colleagues, Social Sciences respondents cite 'time to get there' (57%), 'problems with rights of access' (23%) and 'charges for use, or other additional costs' (18%) as significant problems.

Physical access v. online access

Physical access to research materials is currently more important to respondents than to their scientific colleagues. 45% consider it very important; however, of these 69% believe this importance will remain the same over the next ten years and 17% believe physical access will **decline** in importance. Of the 35% of respondents who believe it is currently fairly important, 46% think it will remain the same in future, and 49% believe it will become **less** important.

1.3.3 Research methods in Social Sciences

Priority research methods

The Social Sciences respondents follow a similar pattern of research discovery and access methods as their scientific colleagues: the following priority list includes percentage of respondents who regard each method as **essential** in parentheses:

- Consulting books and journals (93%)
- Searching catalogues, both online and card (75%)
- Accessing online electronic books and / or articles (61%)

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- Using other library technology, such as photocopying, scanning and printing out (58%)
- Using inter-library loan services (59%)
- Browsing through collections of books or other materials (46%)
- Using enquiry and research assistance (36%)
- Consulting primary materials (24%)

In future, 31% expect to do more searching of online and card catalogues; 20% expect to make more use of enquiry and research assistance and to use inter-library loans more. 68% of respondents expect access to electronic information books and journal articles to become an even higher priority.

1.4 Area Studies and Languages

123 respondents to the survey are engaged in research in Area Studies and Languages.

1.4.1 Research sources in Area Studies and Languages

Primary sources

The use of rare books and manuscripts is very important in Area Studies and Languages, in which 61% of the respondents regard their use as essential and a further 15% use them. 10% of respondents also consider maps and charts essential and a further 26% use them in their research.

In Area Studies and Languages moving images and/or sound recordings are considered essential by 27% of the respondents and used by a further 23%.

The use of computerised datasets as primary sources is confined to only 33% of the Area Studies and Languages respondents, and 12% consider their use essential to their research. 23% of respondents believe that their use of such datasets will increase.

Secondary sources

Printed refereed journals, as well as books and other current publications, are considered to be essential research tools by 98% of the respondents in Area Studies and Languages. In addition, 52% of respondents also consider other printed, non-refereed journals as essential; 34% view newspapers as essential and 34% use them routinely in research. 72% of Area Studies and Languages respondents believe that their current use of printed journals will **not change** over the next 10 years.

Views on the use of electronic journals and other electronic information services are strikingly different from those respondents in scientific or social science research: only 26% of respondents consider e-journals to be essential, although a further 50% do use them in their research. However, 60% also believe that they will use electronic journals more in future.

The growth in importance of electronic pre-print archives particularly to scientific research is not reflected in the survey responses from Area Studies and Languages: only 12% consider pre-print archives essential, though a further 24% do use them. However, 38% of respondents expect to use pre-print archives more in future, including 18% who do not currently use them.

Once again, the high importance of journals (printed and electronic) and published books underpins high levels of use of bibliographic tools, indexing and abstracting services. 74% of the respondents regard them as essential. 28% of respondents believe their use of these bibliographic and indexing tools will increase in future. Electronic full text services, providing researchers with access to text as well as abstracts and bibliographic citations, are regarded as essential only by 27% of respondents, though a further 43% do use them in their research. 47% expect electronic full-text services to be used more in future.

Surrogates

Respondents working in Area Studies and Languages make the most use among all the disciplines of microfiche and microfilm sources: 51% consider microfiche and microfilm materials to be essential, and a further 31% use them in their research. It

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seems likely that this correlates with the relatively high use of newspapers in Area Studies and Language research.

Other sources of research information

The research indicates a lower level of use of electronic bulletin boards and discussion lists in research among the respondents in Area Studies and Languages – around 32% use them without regarding them as essential. Use of electronic alerting services is also at a lower level than among scientific research respondents, with only 27% making use of such services.

1.4.2 Finding Area Studies and Language materials

Internal and external providers

Use of a greater range of providers is indicated in responses from Area Studies and Language. 91% regard the materials in their own private collections as essential; 86% consider their own institution's library as essential, 12% of Area Studies and Language respondents expect to use their home university more in future. 30% feel their own departmental resources are essential. 22% of respondents see their own university museum and/or archives as essential to their research.

All respondents of 91% of respondents use other university libraries and 72% of respondents regard this use as essential to their research; 20% expect to use other university libraries more in the next 10 years. 36% use other research institute libraries and 20% regard these as essential.

Of other external and national providers of research resources, 66% of respondents in Area Studies and Language see the British Library as essential and 23% of them believe they will use the British Library more in future. 33% think other copyright libraries also are essential; 30% use national museum resources and 15% regard them as essential; 37% use the Public Record Office and other national archives, and 20% regard them as essential. 62% of respondents consider libraries, museums or archives outside the UK are essential to their research and 25% believe they will use libraries and other research resources outside the UK more in future.

65% of Area Studies and Language respondents regard contact with colleagues and attendance at conferences essential to their research.

Attitudes towards their home university library services

Of the respondents, 25% think that their own institution's library meets their research needs very well; 37% think fairly well and 31% think not very well. Asked to comment on ways in which their home university library facilities and services could be improved, respondents cited more investment in/subscription to up-to-date journals (24%), a better range of specific types of journals (22%) and a better range of reference books and journals generally (19%).

Constraints on access to materials

Researchers were asked what difficulties, if any, they have using other libraries. The Area Studies and Language respondents cited 'time to get there' (71%), 'difficulties with ordering materials / reserving books' (30%) and 'charges / additional costs' (27%).

Physical access v. online access

82% of respondents in Area Studies and Language regard physical access to

materials as very important, and 12% fairly important. Of the former, only 9% believes that such access will become **less** important in the future.

1.4.3 *Research methods in Area Studies and Languages*

Priority research methods

More respondents in Area Studies and Language appear to employ a wider range of research discovery and access methods than colleagues in sciences and Social Sciences: the following priority list includes percentage of respondents who regard each method as **essential** in parentheses:

- Consulting books and journals (98%)
- Searching catalogues, both online and card (87%)
- Browsing collections of books or other materials (69%)
- Using other library technology, such as photocopying, scanning and printing out (69%)
- Using inter-library loan services (66%)
- Consulting primary materials (62%)
- Consulting surrogates of primary materials (50%)
- Using enquiry and research assistance (39%)
- Accessing online electronic books and / or articles (36%)

12% of Area Studies and Language respondents expect to use surrogates more; 19% expect to do more searching of online and card catalogues; 20% expect to make more use of enquiry and research assistance; 23% to use inter-library loans more; and 54% expect accessing electronic information to become more important.

1.5 Arts and Humanities

250 respondents to the survey are engaged in research in the Arts and Humanities.

1.5.1 Research sources in Arts and Humanities

Primary sources

50% of respondents regard rare books and manuscripts as essential to their research and a further 13% use such materials. Only 18% of respondents believe that their use of rare books and manuscripts will increase. These proportions are lower than those for respondents in Area Studies and Languages, and are, perhaps, surprising considering that historical studies are included in Arts and Humanities.

Images are important primary sources of information: 42% of respondents think photographs are essential; 21% believe that they will use photographs and still images more in future. Moving images and/or sound recordings are regarded as essential by 22% of the respondents and 17% will use them more in future.

The survey indicates that artefacts and objects are reasonably important to respondents from Arts and Humanities: 25% regard artefacts as essential and a further 15% do use them in their research. Also, maps and charts are considered essential by 17% and a further 23% use them.

A small percentage - 14% - of respondents in Arts and Humanities consider computerised datasets as essential, while 22% also use them in their research.

Secondary sources

Printed refereed journals are considered to be essential research tools by 84% of the respondents in Arts and Humanities; and 46% also consider other printed, non-refereed journals essential in their research. 26% of respondents in Arts and Humanities believe that they will use printed refereed journals **more** in the future. Only 22% consider electronic journals and other electronic information services essential, though a further 43% do use them, and 57% of the respondents also expect to use electronic journals more, including 12% who do not currently use them at all.

Newspapers are essential to 27% of the respondents and 35% also use them in their research.

The growth in importance of electronic pre-print archives to scientific research is not replicated in Arts and Humanities, according to the survey responses: only 10% consider pre-print archives as essential, though 34% do use such electronic sources. However, 45% of respondents expect to use pre-print archives more in future, including 15% who currently do not use them at all.

The importance of books and other current publications to research in Arts and Humanities is demonstrated by 93% of respondents, who consider these essential.

Bibliographic tools, indexing and abstracting services are considered essential to research by 56% of Arts and Humanities respondents, and are used by a further 27%. Only 24% consider electronic full-text services essential, though an additional 38% use them. 29% of respondents believe their use of these bibliographic and indexing tools will increase, and 53% expect electronic full-text services to be used more in future.

Surrogates

Use of microfiche and microfilm materials is relatively high among the respondents in Arts and Humanities – 33% regard these kinds of surrogate materials as essential to research and a further 32% use them.

Other sources of research information

Use of electronic bulletin boards appears to be slightly lower in Arts and Humanities research, with only 33% of the respondents making use of them; 52% of respondents make use of discussion lists, however, while electronic alerting services are used by only 25% of the respondents and considered essential to their research by only 9%.

1.5.2 Finding materials in Arts and Humanities

Internal and external providers

In common with colleagues in Area Studies and Language, respondents from the Arts and Humanities use a wide range of research information providers. 90% regard their own private collections as essential to their research; and 28% their departmental resources. 76% regard their own institution's library as essential and 19% of Arts and Humanities respondents expect to use their home university more in future. 46% use their own university's museum and/or archives, and 22% find these essential in their research. Other local research providers include local record offices (29% use these and 16% regard them as essential), and local or regional museums (31% use them, and 11% consider them essential).

53% of respondents consider other university libraries as essential, and a further 28% use them in their research, while 24% expect to use other university libraries more in the next 10 years. Research institute libraries are seen as essential by 28% of the respondents.

The British Library is considered essential by 51% of respondents and used by a further 23% and 28% of them believe they will use the British Library more in future. Other significant external and national providers which are considered essential include national museums (28%), the Public Record Office and other national archives (26%) and other copyright libraries (20%). 41% of the respondents regard libraries, museums and/or archives outside the UK as essential and 29% believe they will use libraries and other research resources outside the UK more in future.

67% consider networking with colleagues and attending conferences essential in their research.

Attitudes towards their home university library services

Of the respondents, 23% think that their own institution's library serves their research needs very well; 50% fairly well and 24% not very well. Researchers were asked to comment on ways in which facilities and services could be improved in their library. 26% of Arts and Humanities respondents want a better range of specific types of journals and 18% want a better range of reference books and journals generally.

Constraints on access to materials

When asked what difficulties, if any, they have in using other libraries, the respondents cited 'time to get there' (63%), 'problems with rights of access' (22%) and 'difficulty with ordering / reserving books' (19%).

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Physical access v. online access

72% of Arts and Humanities respondents think that physical access to materials is very important, and of those, 12% believe that such access will increase in importance in future. Of the 17% who regard physical access as fairly important, 44% believe it will remain so, and 41% believe such access will **decline** in importance in the future.

1.5.3 *Research methods in Arts and Humanities work*

Priority research methods

Respondents in Arts and Humanities employ a wide range of research discovery and access methods: the following priority list includes percentage in parentheses of respondents who regard each method as **essential**:

- Consulting books and journals (96%)
- Searching catalogues, both online and card (71%)
- Using other library technology, such as photocopying, scanning and printing out (69%)
- Consulting primary materials (67%)
- Browsing through collections of books or other materials (64%)
- Using inter-library loan services (49%)
- Consulting surrogates of primary materials (36%)
- Accessing online electronic books and / or articles (30%)
- Using enquiry and research assistance (28%)

18% of respondents expect to consult books and printed journals **more** and 23% to consult primary materials more in future. 24% expect to do more searching of online and card catalogues; 30% to make more use of library technology; 24% to use inter-library loans more; and 51% expect access to electronic information to become more important.

1.6 Survey outcomes relating to the subject groups

In this section, selected survey results have been brought together in tabular form, to underpin and support the previous five sections describing, respectively, Medical & Biological Sciences, Physical Sciences & Engineering, Social Sciences, Area Studies & Languages and Arts & Humanities.

1.6.1 Research sources

The survey asked researchers, which, of a list of information sources, they currently find essential, or use without being essential, or do not use in their research, and how levels of use might or might not change over time.

Primary sources

Table 14: Use of primary sources by Subject Area

	Medical & Biological Sciences		Physical Sciences & Engineering		Social Sciences		Area Studies & Languages		Arts & Humanities		All respondents	
	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more
Computerised data sets	55%	44%	51%	39%	51%	31%	33%	23%	36%	27%	48%	34%
Rare books & MSS	17%	2%	14%	3%	23%	4%	76%	12%	63%	18%	31%	7%
Maps & charts	10%	2%	18%	3%	25%	5%	36%	3%	40%	4%	23%	3%
Photographs & still images	50%	18%	38%	12%	39%	14%	65%	16%	70%	21%	49%	16%
Moving images and / or sound recordings	31%	27%	25%	22%	26%	16%	50%	18%	47%	17%	33%	20%
Artefacts	5%	1%	8%	3%	15%	2%	20%	5%	40%	10%	14%	4%

Secondary sources

Table 15: Use of secondary sources by Subject Area

	Medical & Biological Sciences		Physical Sciences & Engineering		Social Sciences		Area Studies & Languages		Arts & Humanities		All respondents	
	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more
Printed refereed journals	100%	11%	99%	12%	99%	20%	100%	15%	94%	26%	98%	17%
Other printed non-refereed journals	72%	5%	75%	4%	88%	8%	90%	8%	88%	12%	82%	7%
Newspapers	27%	1%	23%	3%	75%	8%	68%	7%	62%	5%	50%	5%
Electronic journals & other electronic publications	95%	84%	94%	80%	91%	76%	76%	60%	65%	57%	87%	74%
Electronic pre-print archives	75%	68%	81%	65%	57%	51%	36%	38%	44%	45%	62%	56%
Books & current publications	99%	8%	99%	10%	99%	18%	99%	15%	99%	23%	99%	15%
Bibliographic tools, abstracting & indexing services	94%	59%	91%	48%	89%	43%	94%	28%	83%	29%	90%	44%
Electronic full text services	96%	79%	89%	74%	84%	68%	70%	47%	62%	53%	83%	67%

*Other sources of research information***Table 16: Use of other research information sources by Subject Area**

	Medical & Biological Sciences		Physical Sciences & Engineering		Social Sciences		Area Studies & Languages		Arts & Humanities		All respondents	
	Use now	Will use More	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more
Surrogates												
Microfilm & microfiche	18%	2%	21%	2%	42%	4%	82%	10%	65%	8%	40%	4%
Other information sources												
Electronic bulletin boards	47%	31%	43%	24%	42%	29%	40%	29%	33%	20%	42%	27%
Electronic discussion lists	51%	25%	45%	25%	46%	27%	47%	16%	52%	25%	48%	25%
Electronic alerting services	64%	45%	56%	35%	53%	36%	27%	20%	34%	20%	51%	34%

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1.6.2 Finding materials.

The survey asked researchers which information providers they regarded as essential and which they use additionally or do not use. The respondents were offered a list of providers, both internal and external to their own institution, and asked them to comment on any difficulties or constraints on gaining access to the material they need.

Table 17: Use of information providers by Subject Area

	Medical & Biological Sciences		Physical Sciences & Engineering		Social Sciences		Area Studies & Languages		Arts & Humanities		All respondents	
	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more
Own private collection	91%	12%	90%	15%	93%	16%	95%	14%	96%	24%	92%	16%
Colleagues / conferences / research networks	96%	24%	94%	23%	96%	22%	99%	15%	93%	25%	95%	23%
Departmental resources	79%	11%	74%	10%	68%	8%	70%	7%	67%	10%	72%	9%
(Home) university library	96%	16%	95%	18%	97%	17%	99%	12%	96%	19%	97%	17%
(Home) university museum or archive	18%	1%	17%	2%	23%	5%	41%	7%	46%	10%	27%	4%
Local public library	10%	*	12%	2%	22%	1%	28%	3%	32%	4%	20%	2%
Local record offices	4%	1%	4%	1%	15%	3%	19%	2%	29%	10%	13%	3%
Local / regional museum	5%	*	5%	*	6%	2%	19%	2%	31%	6%	11%	2%
(Any) other university library	70%	12%	66%	14%	81%	18%	91%	20%	81%	24%	76%	17%
Research institute(s) library	32%	10%	21%	6%	33%	8%	36%	9%	42%	16%	32%	10%
National museums	7%	1%	7%	1%	13%	4%	30%	8%	48%	14%	18%	5%
Public Record Office	10%	3%	4%	1%	24%	9%	37%	9%	41%	16%	20%	7%
British Library	54%	11%	52%	13%	56%	16%	84%	23%	74%	28%	50%	17%
National Library of Wales	3%	1%	3%	1%	4%	1%	11%	2%	8%	3%	5%	2%
National Library of Scotland	5%	1%	5%	2%	6%	2%	19%	5%	20%	6%	9%	3%
Other copyright libraries	26%	5%	24%	5%	30%	7%	54%	10%	41%	10%	32%	7%
Libraries / museums / archives outside the UK	16%	5%	23%	6%	39%	12%	78%	25%	64%	29%	38%	13%

* = less than 1%

1.6.3 Research methods

Researchers were asked to indicate what research methods they currently use, what are essential and what changes they foresee in these working patterns over the next 10 years.

Table 18: Access and discovery methods by Subject Area

	Medical & Biological Sciences		Physical Sciences & Engineering		Social Sciences		Area Studies & Languages		Arts & Humanities		All respondents	
	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more	Use now	Will use more
Consult printed books or journals	98%	7%	99%	11%	99%	12%	100%	11%	100%	18%	99%	12%
Consult primary materials	32%	3%	29%	4%	49%	7%	78%	9%	80%	23%	49%	9%
Consult surrogates	17%	2%	18%	2%	37%	5%	76%	12%	65%	12%	37%	5%
Browse through collections of books or other material	63%	4%	77%	3%	88%	8%	98%	9%	95%	14%	82%	7%
Search catalogues (online or card)	79%	34%	88%	35%	92%	31%	98%	19%	92%	24%	89%	30%
Use enquiry & research assistance	53%	10%	43%	12%	77%	20%	81%	14%	68%	14%	66%	14%
Use inter library loans and/or document delivery	90%	21%	89%	21%	92%	26%	89%	24%	79%	24%	88%	23%
Access online electronic books or journal articles	97%	78%	92%	74%	92%	68%	77%	53%	74%	51%	88%	67%
Use other library technology (photocopying, scanning, printing out etc)	83%	17%	86%	16%	85%	24%	92%	25%	92%	30%	87%	22%

2 Research and Electronic Sources of Information

Researchers were asked a range of questions about where and how they use electronic information sources, including the internet, about their capabilities in using these sources in their research, and about their awareness of the full range of sources available and training / awareness raising activities.

The survey responses were analysed by broad subject discipline, to compare and contrast, in the first instance, any differences in patterns of use and behaviour between the disciplines.

2.1 Accessing electronic sources of information

2.1.1 Points of access

The primary access point for using electronic information services for 80% of the respondents is their office. The significant secondary access points for the respondents are their home (43%) and the central library services in their own university (25%).

There are considerable differences, however, between the subject disciplines. In Arts and Humanities 24% of respondents use their home as the primary access point, and 20% in Area Studies and Language: this contrasts with Medical and Biological Sciences (8%) and Physical Sciences and Engineering (3%).

2.1.2 Search methods

Researchers were asked to rank in importance a range of search methods and electronic resources available to them in locating electronic information. The following list, in priority order, shows the number of respondents who considered each method very important / fairly important.

- 'Generic' web search engines (such as Google) (45%/31%)
- Online catalogues for their library collections (46%/26%)
- Bibliographic databases, abstracting and indexing services (43%/25%)
- Institutional or departmental gateways or portals (33%/31%)
- Subject gateways and portals (such as the Resource Discovery Network) (25%/35%)
- Digital libraries and archives (such as The data Archive, MIMAS, EDINA) (23%/20%)

The survey shows significant differences between subject disciplines in their views on three of these search methods. In Area Studies and Languages and Social Sciences 86% and 80% respectively of respondents regard online catalogues of their home university library collections as both very and fairly important, this figure falls to 73% in Arts and Humanities, and then to 65% and 62% respectively in Physical Sciences and Engineering and Medical and Biological Sciences.

81% of Medical and Biological Sciences respondents, and 70% of those in Area Studies and Language regard online bibliographic databases, abstracting and indexing tools as important finding aids, comparable with 69% in Physical Sciences and Engineering and 67% in Social Sciences. However, the figure falls to 51% in Arts and Humanities.

Finally, 57% of Physical Sciences and Engineering respondents, and 47% of those in Medical and Biological Sciences, regard digital libraries and archives as important finding aids, whereas that figure declines to 41% in Social Sciences, 35% in Arts and

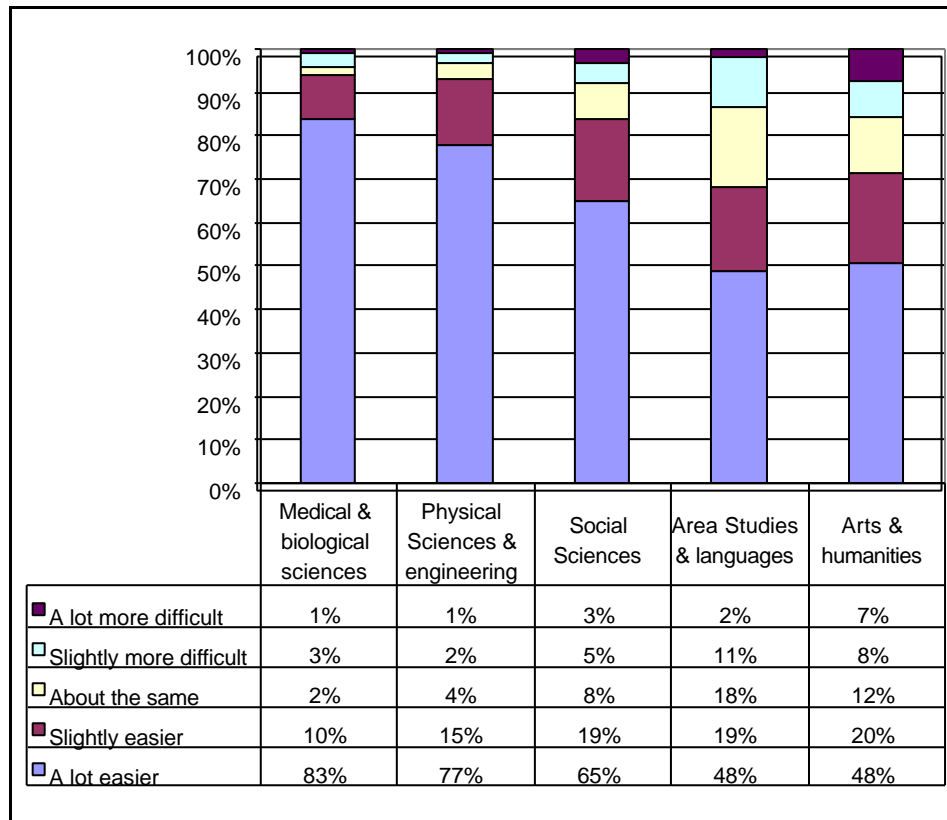
Humanities, and 30% in Area Studies and Language.

2.1.3 Ease of access

Researchers were asked to compare ease of finding, accessing and using information electronically with the more traditional methods of research in their field.

All respondents think it is easier to **find** information electronically, though, as Figure 1 below shows, fewer Arts and Humanities and Area Studies and Language respondents hold this opinion than their scientific colleagues.

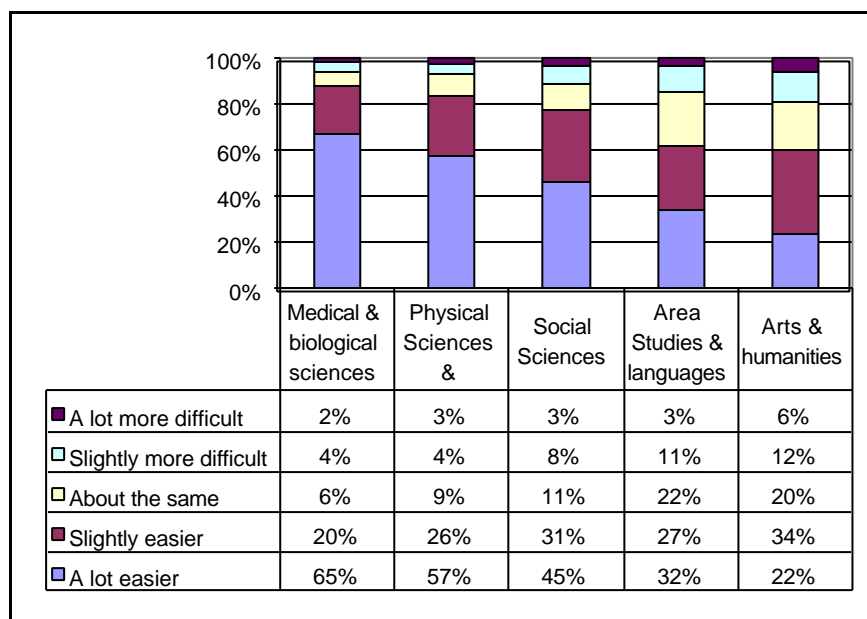
Figure 1 : Ease of finding information electronically compared to traditional means



In making a comparison about **accessing** information electronically, 65% of Medical and Biological Sciences respondents think accessing electronic information is a lot easier, and only 22% in Arts and Humanities. Figure 2 below illustrates the changing relationship between electronic and traditional research methods among all respondents.

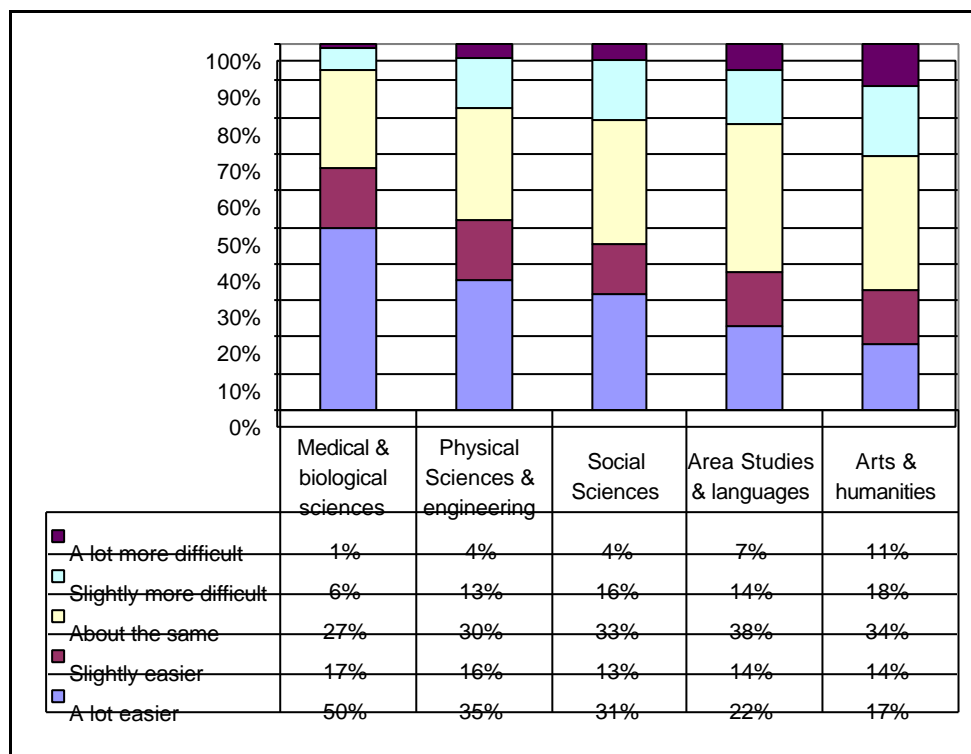
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Figure 2: Ease of accessing information electronically compared to more traditional means



The responses in all subject disciplines are of particular interest when the researchers were asked to compare relative ease in **using** information electronically with more traditional research means. 50% of Medical and Biological Sciences respondents think that it is a lot easier to use electronic information, 27% think it is about the same; in Arts and Humanities, the majority of respondents think it is either about the same or more difficult to use electronic information. Figure 3 below illustrates a remarkably similar pattern of responses.

Figure 3: Ease of using information electronically compared to more traditional means



2.2 Attitudes and capability

2.2.1 Attitudes towards electronic information access and services

The focus groups were used to identify a range of attitude statements relating to the use and effectiveness of electronic information services and products. The researchers were then asked in the survey to indicate levels of agreement or disagreement with this range of statements. The following statements gained broad agreement across all subject disciplines (in order of priority):

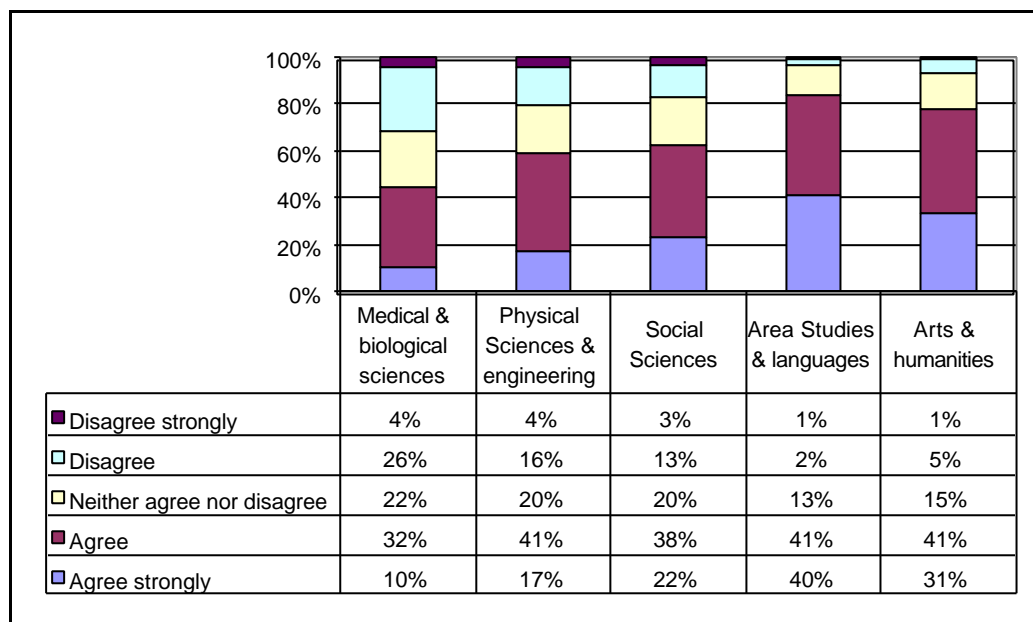
- I would still like access to printed copies as well as electronic access
- It is easier to find information online compared with other methods
- I can now do better research because of electronic and online information sources
- I don't have to rely on others so much when searching electronically
- Research now takes less time

Most respondents in all subject areas neither agreed nor disagreed that 'there is too much information available now', though this is clearly an area of concern as 32% of all respondents did agree with this statement.

In Medical and Biological Sciences, Physical Sciences and Engineering and Social Sciences the majority of the respondents generally agreed that 'more comprehensive information is available online', but only 24% of Arts and Humanities respondents agreed and 38% disagreed.

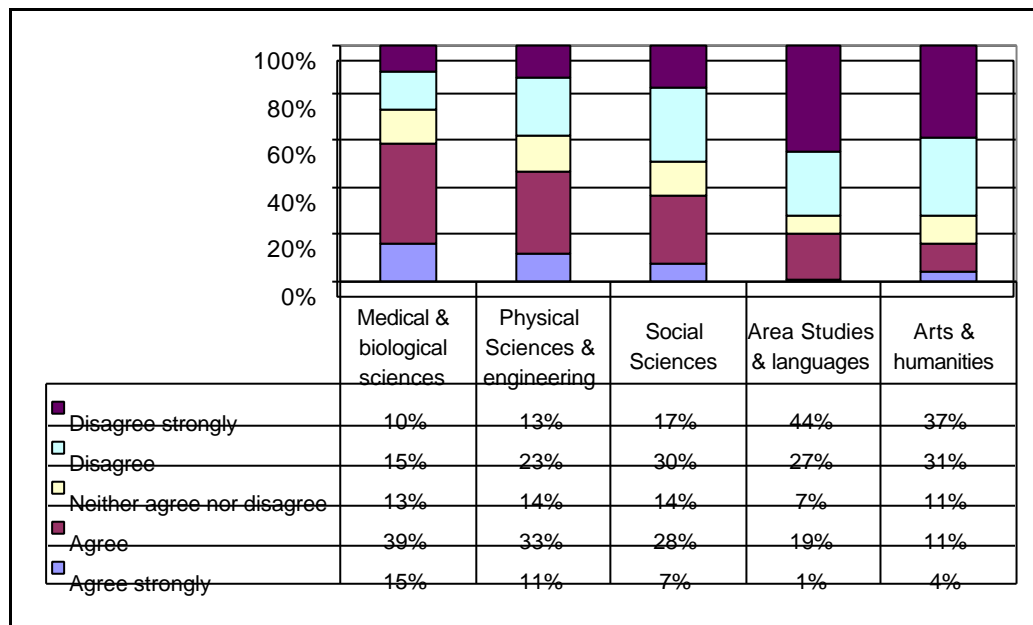
Responses to the statement 'there is less control over the quality and provenance of material made available electronically' reveal quite complex differences between the subject disciplines. As Figure 4 shows, Medical and Biological Sciences and Physical Sciences and Engineering most respondents are inclined to agree with this, though a significant proportion disagree, while most respondents in Area Studies and Language and Arts and Humanities agree quite unequivocally.

Figure 4: 'There is less control over the quality and provenance'



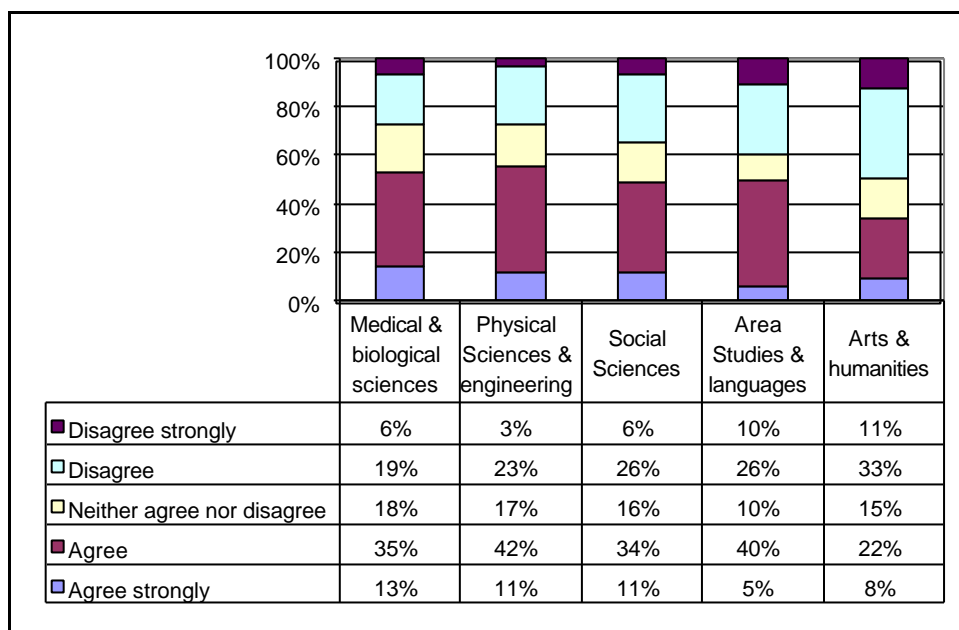
The response to the statement 'electronic databases make physical collections less important' is also a mixed one, with a level of disagreement among respondents from Medical and Biological Sciences, and Physical Sciences and Engineering, that is quite surprising. Figure 5 illustrates the pattern of responses.

Figure 5: 'Electronic databases make physical collections less important'



Finally researchers were asked to consider the view that 'some research information I need now is only available online'. The respondents all broadly agreed with this statement, except those in Arts and Humanities, where 60% of respondents either disagreed or were neutral. Figure 6 below also illustrates the clear similarity in response between the scientific disciplines and Area Studies and Language.

Figure 6: 'Some research information I need now is only available online'



2.2.2 Advantages and disadvantages of electronic sources

Researchers were asked to comment freely on the main advantages and disadvantages of using electronic sources of information, as they perceive them. Relative consensus across all disciplines emerged on the following advantages:

- Easier access from any location (54%)
- Faster access to information (50%)
- Easier and/or faster to undertake searches (29%)
- Ability to download / print information (21%)
- Allows a large range and volume of information to be searched and/or located (20%)

Fewer respondents described disadvantages and a greater range of comments was received:

- Certain material not available on-line (15%)
- The difficulties of finding, sifting and filtering information (13%)
- Server and/or equipment problems (13%)
- Volume of information can be overwhelming (12%)
- Image quality can be poor (11%)
- It is necessary to print out information (11%)
- 'Quality' browsing is harder / less creative (10%)
- Subscription costs increasing (9%)
- Learning new skills (6%)
- Lack of standard methods of accessing (5%)

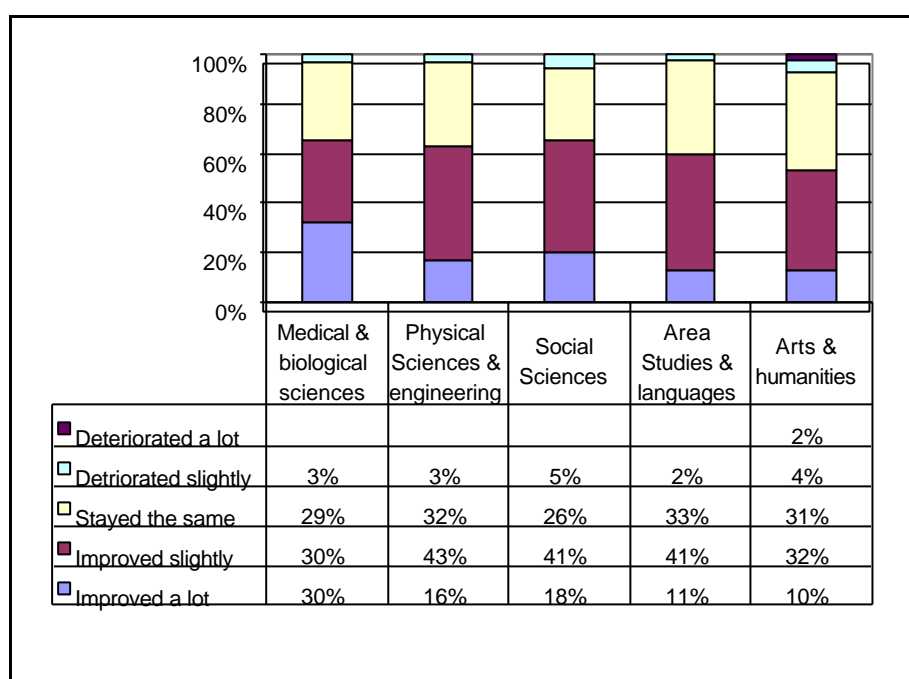
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One comment was made by significantly more Arts and Humanities respondents than by respondents in the sciences:

- Problems with reliability and completeness of information (20%).

Researchers were asked about what the overall impact has been of the newer electronic research on quality of research. As Figure 7 below shows, the majority of respondents in Medical and Biological Sciences consider that access to electronic sources of information has improved the quality of research; responses from Physical Sciences and Engineering, Social Sciences and Area Studies and Languages are similar. Most Arts and Humanities respondents, however, regard quality of research to have improved slightly or stayed the same since the advent of electronic information services.

Figure 7: Overall impact on quality of research of electronic research methods



2.3 Skills and awareness

2.3.1 Training, advice and guidance

Researchers were asked several of questions about their current skills and awareness and invited to comment freely about the kind of training, advice or guidance they have received or would like to receive.

Only 18% of all respondents have received some training, advice or guidance in using computer-based research resources in the last two years. Among pure and applied science respondents, this figure drops further to 15% (Medical and Biological Sciences) and 8% (Physical Sciences and Engineering). Of these respondents who have received some training, 62% went on university library-run courses on using electronic resources, and 37% received informal training.

Researchers were also asked if they actually make use of any advice and help in searching for electronic and online resources offered by their departmental or own university library. Responses are very similar across all subject disciplines, with Arts and Humanities, Area Studies and Language and Social Sciences researchers slightly

more likely to seek and accept advice and help where it is offered.

Overall, 11% of all respondents answered that no help or advice is offered to them by the library services; 35% answered that they do not take up help and advice which is offered; and 17% responded that they do not know whether any help or advice is offered by the library service.

2.3.2 Skills and awareness gaps

Between 53 – 67% of all respondents, across all disciplines think they need a little or some more training, advice or guidance. 22% of Arts and Humanities respondents believe they need a **lot** more training, in contrast to 6% in Physical Sciences and Engineering and 8% in Medical and Biological Sciences.

Physical Sciences and Engineering respondents consider themselves the most skilled: 40% believe they need no more training, compared to 24% of Medical and Biological Sciences respondents, 17% Social Sciences, 15% Area Studies and Languages and 14% of Arts and Humanities.

When this group was asked ‘why do you feel that you don’t need further training, advice or guidance?’ 88% answered that they are ‘confident that I can find what I need’, 16% that they have ‘no time for training’, and 15% that ‘training is rarely of any help or usefulness’.

When asked to rank a list of possible things they might like to know more about, all respondents display a remarkable degree of unanimity across the disciplines:

- Specialist online search skills(68%)
- Ways of keeping up-to-date with what is available (65%)
- Locating high-quality information sources (65%)
- How to filter online information effectively (57%)
- How to find / create online archives (43%)
- To find out what resources are available through their own university (42%)

3 Patterns of Research Behaviour among Sub-groups

3.1 Regional differences

Contrary to some assumptions made at the beginning of the research process, there are few significant differences in responses from the 9 regions of England¹³, Wales, Scotland and Northern Ireland. In the following results, account has been taken of the possible effects of subject biases in among respondents in some regions.

3.1.1 Finding materials

Using research institutes

More respondents in London use research institutes than in other regions: 23% of respondents use research institutes and 20% consider them essential to their research, in contrast to 14% and 18% of all respondents. This no doubt has a link with the sheer number of research institutes located in London in contrast to other cities in the UK.

The British Library

Despite assumptions to the contrary, there is no indication of greater use among the London-based respondents of the British Library and other national institutions such as the Public Record Office, or the national museums. In Yorkshire & Humberside and the North East region, however, 45% and 51% respectively of respondents consider the British Library essential to research, in contrast to 36% of all respondents. This may be linked to the proximity of the British Library Document Supply Centre at Boston Spa.

National Libraries of Wales and Scotland

13% of respondents in Wales think the National Library of Wales is essential to research, and a further 19% use the Library. In Scotland 17% consider the National Library of Scotland essential and a further 23% use it. 10% of respondents in the North East region also consider the National Library of Scotland essential.

Other copyright libraries

Overall only 14% of survey respondents consider other copyright libraries to be essential and further 17% do use them. These figures rise to 26% and 22% respectively in Northern Ireland (this may indicate use of Trinity College Dublin), and 21% and 20% respectively in the East Midlands (possibly indicating use of Cambridge University Library).

Satisfaction with their own university library

25% of all survey respondents think their own university library meets their research needs very well and a further 50% think they are met fairly well. These figures change to 32% and 46% in London; 39% and 41% in the Eastern region and 29% and 52% in the North East.

3.2 The researchers

The respondents were grouped according to age range, the amount of time they spend in research, whether they work alone or as part of a team, and whether or not they supervise other researchers. The results reported on below are those in which a

¹³ London, South East, South West, Eastern, East Midlands, West Midlands, Yorkshire & Humberside, North West, North East

significant difference in responses has been identified among these sub-groups.

3.2.1 Age

The respondents were grouped according to the following categories:

Up to 39	417
40 – 49	426
50 – 59	449
60 or over	125

In addition, 224 postgraduate research students returned the questionnaire, and are shown in this section as a separate category. Where their responses differ significantly from responses to the main survey this is indicated. To facilitate comparison between the main survey responses and the postgraduate sample, postgraduates are not included in the column 'All respondents'.

No significant differences were found among these age groups in the types of research information sources and information providers used or anticipated for future use.

It was assumed that differences would emerge in attitude to and aptitude with electronic information sources. This was confirmed, though variations between age groups are not as wide as anticipated, and the age group 50 – 59 appear to be more at ease with research using electronic information sources than we had assumed.

For example, Tables 19 – 21 below summarise the responses to the question 'to what extent do you think finding, accessing and using electronic and online research information is easier compared with more traditional means?' Broadly, all respondents think finding electronic information is easier (Table 19), but significantly fewer (43%) think this in the age group 60+ than among the younger respondents (over 70%) and postgraduates (over 80%).

Table 19: Finding electronic and online information

	Up to 39	40-49	50-59	60 +	All respondents	Post-graduate
A lot easier	77%	73%	59%	43%	67%	81%
Slightly easier	14%	15%	18%	23%	16%	9%
About the same	5%	6%	11%	11%	8%	4%
Slightly more difficult	3%	3%	7%	10%	5%	2%
A lot more difficult	1%	1%	4%	7%	3%	2%

Overall, fewer respondents display clear preference for accessing research information electronically compared to traditional means (Table 20), and here the variation between the age groups is much less pronounced.

Table 20: Accessing electronic and online information

	Up to 39	40-49	50-59	60 +	All respondents	Post-graduate
A lot easier	55%	49%	40%	38%	47%	62%
Slightly easier	25%	29%	31%	22%	28%	22%
About the same	13%	12%	11%	13%	12%	9%
Slightly more difficult	5%	6%	9%	12%	7%	5%

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A lot more difficult	1%	3%	5%	7%	3%	2%
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Using electronic information sources, compared to more traditional research sources, is not considered any easier or more difficult by 31% of the all the respondents (Table 21) and the responses of the younger age group and the postgraduates do not differ widely from the age groups 50-59, and 60+.

Table 21: Using electronic and online information

	Up to 39	40-49	50-59	60 +	All respondents	Post-graduate
A lot easier	36%	37%	26%	22%	32%	43%
Slightly easier	15%	15%	14%	13%	15%	15%
About the same	33%	30%	32%	28%	31%	27%
Slightly more difficult	11%	13%	16%	15%	13%	10%
A lot more difficult	4%	3%	7%	11%	5%	4%

The responses to the attitude statements, asking researchers for views about online and electronic sources of research information, are similarly balanced across the age groups. While only 22% of 60+ group strongly agree that better research can be done using electronic information sources (Table 22), compared to 38% of the 'up to 39' group and 51% of the postgraduates, a further 29% are nonetheless in agreement with the statement, and only 15% actively disagree.

Table 22: Level of agreement that better research can be done using electronic information sources

	Up to 39	40-49	50-59	60 +	All respondents	Post-graduate
Agree strongly	38%	36%	29%	22%	33%	51%
Agree	38%	36%	39%	29%	37%	30%
Neither agree nor disagree	15%	19%	16%	28%	18%	9%
Disagree	8%	5%	11%	15%	8%	8%
Disagree strongly	1%	2%	3%	4%	2%	

Similarly, the responses indicate that the older researchers are almost equally inclined as the younger age groups in the main survey to agree that the overall impact of newer electronic research methods has been largely positive (Table 23). However, there is a difference here between the main survey and the postgraduates, where markedly more respondents believed in a substantial positive impact on quality of research.

Table 23: Nature of overall impact on quality of research of newer electronic research methods

	Up to 39	40-49	50-59	60 +	All respondents	Post-graduate
Improved a lot	17%	21%	17%	15%	18%	38%
Improved slightly	41%	37%	35%	39%	38%	30%
Stayed the same	30%	27%	32%	30%	29%	17%
Deteriorated slightly	3%	2%	5%	6%	4%	
Deteriorated a lot	0%	1%	0%	2%	1%	

3.2.2 Attitude / aptitude for using electronic information

We devised a variable based on responses to survey question E3 (see Appendix 1) to derive three groups of respondents in terms of their attitude to electronic resources, as follows:

Positive (score of 21 plus)	497
Middle (15 – 20)	702
Negative (14 or less)	228

Responses to questions about types of research information and sources, information providers and access and discovery methods were then analysed using these groups to see if attitude to electronic information resources has any impact upon researchers' behaviour and work patterns.

Significant differences in responses between the positive and negative groups appear in two areas – in respondents' views on the importance of physical access to libraries to their research, and their view as to whether or not they require more training, advice or guidance in using electronic information tools and facilities.

In the former, the majority of the group of respondents with an overall negative attitude towards electronic resources consider physical access to libraries very important (see Table 24), compared to 28% of those with an overall positive attitude.

Table 24: Importance of physical access to libraries

	Positive attitude to e-resources	Middle	Negative attitude to e-resources	All respondents
Very important	28%	48%	76%	46%
Fairly important	35%	37%	12%	32%
Not very important	29%	11%	5%	17%
Not at all important	7%	3%	6%	5%

As one might expect, there is a significant difference in views of the future importance of physical access to libraries over the next ten years (Table 25 between respondents with a positive and negative attitude to electronic resources. The majority (65%) of those with a negative attitude consider that physical access will have the same importance, but almost the same majority of those with a positive attitude think physical access to libraries will be less important in the future.

Table 25: Importance of physical access to libraries over the next ten years

	Positive attitude to e-resources	Middle	Negative attitude to e-resources	All respondents
More important	2%	5%	14%	5%
Will remain the same	33%	60%	65%	51%
Less important	61%	32%	11%	39%
Don't know	4%	4%	10%	5%

The respondents views on whether or not they require some more training, advice and guidance on using electronic research tools are informative. The large majority of those with an overall negative view of electronic resources consider that they do need more (Table 26), which leads to the conclusion that their negativity is strongly associated with lack of skills and confidence. The corollary – that positive attitudes towards electronic resources arise from being skilled and fully confident - however, cannot be assumed, as 65% of the respondents with overall positive attitudes still report that they need some more training.

Table 26: Extent to which more training / advice / guidance is needed

	Positive attitude to e-resources	Middle	Negative attitude to e-resources	All respondents
Need a lot more training	6%	13%	29%	13%
Need some more training	30%	38%	29%	34%
Need a little more training	35%	28%	22%	30%
Need no more training	28%	20%	17%	23%

3.2.3 Team working

The respondents were grouped according to whether they worked primarily as part of a research team or primarily alone, with the following results:

Primarily alone	809
Part of team	581
Not stated	38

A significantly greater proportion of those with a positive attitude towards electronic resources are working as part of a research team, rather than working primarily alone – see Table 27 below.

Table 27: Attitude towards electronic resources

	Working primarily alone	Working as part of a team	All respondents
Positive attitude towards e-resources	26%	48%	35%
Middle	53%	44%	49%
Negative attitude towards e-resources	21%	8%	16%

Members of research teams also appear to be more likely to regard online and electronic books and journals as essential research tools (Table 28) than those working primarily alone. 76% of respondents who work as part of a team think they will use electronic access and discovery methods more in future in contrast with 61% of those who work primarily alone.

Table 28: Use of online / electronic books & journals for access and discovery

	Working primarily alone	Working as part of a team	All respondents
Use and essential to my research	49%	74%	59%
Use, but not essential	35%	21%	29%
Do not use	15%	4%	11%

3.3 The institutions

The institutions, within which the researchers responding to the survey work, were grouped in a number of ways: by age / type of higher education institution¹⁴, by library spend¹⁵, whether the institutional library is a member of the Consortium of University Research Libraries (CURL) or not, and the institutional RAE rating for 2000/01. The results reported on below are those in which a significant difference in responses has been identified among these institutional sub-groups.

3.3.1 Type / age of HE institution

The following sub-groups were devised based on date of creation of the university and whether the institution is a Higher Education College: the results are as follows.

Pre 62	911
1962 – 1991	238
Post 92	248
HE College	31

HE colleges have been deliberately excluded from the analysis summarised below as only ten of the 28 respondents from HE colleges undertake research in sciences or social sciences, therefore the subject bias is too great to deduce valid conclusions.

Contrary to our assumptions, the only significant variation in responses from each of the remaining three groups of universities is in the use of researchers' own home university library and other university libraries. Table 29 shows that significantly more researchers in the Pre-1962 group regard their own university library as essential.

Table 29: Usefulness of researchers' home university library service

	Pre 1962	1962 - 1991	Post 1992	All respondents
Use and essential to my research	87%	83%	73%	83%
Use, but not essential	11%	13%	22%	14%
Do not use	2%	4%	4%	3%

Similarly, high levels of satisfaction with their own university library appear to be more prevalent among researchers in the pre-1962 group, than among those in either the 1962-1991 group or the post-1962 group: Table 30 summarises responses to the question 'how well do your libraries (departmental or own university) meet your research needs?'

Table 30: How well does your library meet your research needs?

	Pre 1962	1962 - 1991	Post 1992	All respondents
Very well	29%	17%	17%	24%
Fairly well	50%	49%	49%	50%
Not very well	17%	28%	27%	21%
Not well at all	3%	6%	7%	4%

Finally, 48% of researchers in post-1992 universities regard at least one other

¹⁴ Using categories supplied by HEFCE.

¹⁵ Using data provided by the Standing Conference of National and University Libraries (SCONUL)

university library as essential to their research, in contrast to 36% of those in pre-1962 universities.

3.3.2 Library spend

The institutions of the respondents were grouped as follows by library spend per full time equivalent student (FTE) using data obtained from SCONUL:

Low (less than £250 per FTE student)	408
Medium (between £250 - £350)	429
High (more than £350)	448
Not available	142

The library spend groups correlate closely with the type / age of HE institution groups as Table 31 below shows.

Table 31: Library spend per FTE by type / age of university represented in survey responses

	Pre 1962	1962-1991	Post 1992	All respondents
Low spend	11%	39%	80%	29%
Medium spend	32%	46%	9%	30%
High spend	46%	12%	2%	31%
Not available	11%	3%	10%	10%

It therefore comes as no surprise that other responses from researchers relating to satisfaction with their own university library services should also show a pattern in high, medium and low spending institutions similar to those in pre-1962, 1962-1991 and post-1992 groups. Table 32 illustrates this similarity when compared to Table 31 above.

Table 32: How well does your library meet your research needs?

	High spend	Medium spend	Low spend	All respondents
Very well	36%	19%	19%	25%
Fairly well	50%	52%	50%	50%
Not very well	11%	24%	25%	21%
Not well at all	2%	4%	5%	4%

These results are also supported by the views of the respondents towards using inter-library loans, where significant differences between responses in high and low spend institutions can be seen – as shown in Table 33.

Table 33: Current use of inter-library loans for research

	High spend	Medium spend	Low spend	All respondents
Use and essential to my research	45%	63%	66%	57%
Use but not essential	38%	31%	24%	31%
Do not use	17%	6%	10%	12%

3.3.3 CURL / non-CURL institutions

Contrary to our expectations, there are no significant differences in any question areas in the returns from respondents in institutions whose libraries are members of the Consortium for University Research Libraries (CURL) when compared to those from non-member institutions.

3.3.4 RAE rating

The respondents to the survey were grouped according to the RAE rating for the relevant unit of assessment in their institutions, resulting in four groups:

Grade	Respondents
1 – 3	285
4	386
5	500
5*	256

No significant differences in responses emerged except related to two areas – the level of satisfaction felt with their own university library and the incidence of training, advice and guidance on using electronic research tools.

The amount of library spend per FTE in respondents' home institutions correlates closely with the RAE rating groups, as Table 34 shows.

Table 34: Library spend and RAE ratings of respondents' institutions

	Grades 1-3	Grade 4	Grade 5	Grade 5*	All respondents
Low spend	66%	30%	17%	9%	29%
Medium spend	18%	32%	36%	29%	30%
High spend	4%	30%	35%	57%	32%
Not available	12%	9%	12%	5%	10%

It is, therefore, not unexpected that significantly more respondents in units of assessment with Grade 5 and Grade 5* ratings than with grade 1-3 ratings feel that their home university libraries meets their research needs very well – see Table 35.

Table 35: How well does your own library meet your research needs?

	Grades 1-3	Grade 4	Grade 5	Grade 5*	All respondents
Very well	15%	24%	27%	31%	24%
Fairly well	52%	49%	50%	48%	50%
Not very well	26%	23%	18%	18%	21%
Not at all well	6%	4%	4%	2%	4%

The survey indicates that respondents in units of assessment with Grade 1-3 ratings are significantly more likely to have received training, advice and guidance in using electronic research sources and tools: 26% of those respondents say they have received such in the last two years, in contrast with 16% and 15% respectively of the respondents in Grade 5 and Grade 5* institutions.