

Final Report

"Give a man a fish and he will eat for a day. Teach a man to fish and he will eat for the rest of his life" (Chinese proverb)

1. Background to the Project - *Recognising an Information Need*

The purpose of this report on the work of the Big Blue project, is to offer all staff engaged in the delivery of information skills training an opportunity to review their current provision and find inspiration from some of the examples of 'good practice' identified by the project team in the course of its research.

Following the model of the information literate person (see page 14), this report is structured to reflect the various iterations of the information seeking process. The first stage in the process is the recognition of an information need. When the JISC commissioned this project it was in response to a need to identify the status of information skills training within the post-16 arena. In turn, this research can also be seen to be timely within the broader social context, in particular, the expansion of access to post-16 education, an increasing emphasis on the need to engage with lifelong learning, the introduction of Key Skills and the continuing demand from employers for graduates with an ability to analyse, evaluate and process information effectively. The impact of these factors, taken alongside the increase in volume and access to web-based electronic resources and services, and increasingly cost effective access to the Internet from home and work created a situation which begs the question: *"How do students learn to recognise, access, evaluate and apply good quality information effectively?"*

2. Introduction to the Project's Work - *Addressing the Information Need*

In addressing the information need, the Big Blue project adopted an empirical approach to its research. A heavy emphasis was placed on secondary information from published sources and existing practices, but, nonetheless, the value in gathering together this information lies in the identification of trends, common approaches and peer assessed instances of 'good practice'. It was critical to the project's credibility that this exercise was thorough and contributed to a sound basis for recommendations to the wider community.

Reflecting the various iterative stages in the information seeking process, there was a continuous need for the team to 'reflect, review and revise' during the course of the project's research. This formative evaluation process has ensured that the project's conclusions are as inclusive as possible in meeting the perceived needs of the post-16 community.

3. Literature Review & Audit - *Retrieving Information*

To gain an overview and understanding of the theory and practice relating to information skills, a literature review and an audit of current practice were carried out. These preliminary research activities provided a context and basis for the subsequent stages of the research process.

3.1 Literature Review

Approach

Searches were undertaken on LISA (Library and Information Science Abstracts), BEI (British Education Index) and BL Inside for material published between 1995 and the present day. The results were grouped according to geographical location, predominantly USA, Australia and the UK, as well as by sector, specifically higher and further education. Over 400 items were located, of which about 100 were felt to be of relevance to the project. These items supplemented material which had been identified to support the project bid.

The full text of the literature review can be found in Appendix 1 and on the project website at <http://www.leeds.ac.uk/bigblue/litreview.htm> and <http://www.leeds.ac.uk/bigblue/litreviewuk.html>

3.1.1 Summary of findings from Literature Review

Introduction

In discussing information skills, authors repeatedly identified the need for effective training if students are to be equipped with the skills to locate, access, evaluate and act on information received. These skills are not only important in terms of the educational experience but are a key element in future employability and in the concept of lifelong learning.

The link between lifelong learning and information skills is constantly made throughout the literature.

Key Terms

Within the literature a geographical division is made between the terms 'information skills' and 'information literacy'. The United States and Australia favour the term information literacy, whereas the term information skills is used within the UK.

In many instances both terms are used to describe what is essentially the same concept. In essence information literacy describes the acquisition of a particular range or set of information handling skills. Within the literature the phrases are often used interchangeably and this approach has been adopted in the work of the project.

Other suggested terms include 'information fluency' (Rader, 1999) and 'information competency' (Goetsch and Kaufman, 1998).

Definitions and Characteristics

Many definitions of information literacy have been suggested. Most include some correlated set of characteristics which describe the attributes of an information literate person. These tend to include:

- effective information seeking;
- informed choice of information sources;
- information evaluation and selection;
- comfort in using a range of media to best advantage;
- awareness of issues to do with bias and reliability of information; and
- effectiveness in transmitting information to others.

(Webber, 2000)

Although there is no overall consensus on a single, authoritative definition of 'information literacy', perhaps one of the most widely quoted is that of the American

Library Association Presidential Committee on Information Literacy, which, in its 1989 Report stated:

To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information...*Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand.* (Italics added).

(ALA, 1989)

This definition has been the subject of some debate but overall it is widely accepted as an articulation of the major features and characteristics which describe information literacy. The first part is the most widely quoted in terms of defining information literacy. The second part provides context by making the link between information literacy and the concept of lifelong learning.

United States

The United States is credited with having well-developed approaches and strategies towards information skills training, although from the literature there is no discernible reason as to why the US should have responded so quickly to the shift in the demands of an information based economy. It is more likely to be external pressures, such as the development of the Internet, which have led to library staff and associated professional bodies recognising and rapidly engaging with the development of an information skilled population.

Australia

Australia also has well-developed information literacy strategies, both within higher education and wider societal contexts. There have been a number of influential reports produced by the higher education sector and by the government, as well as work carried out by scholars in this field such as Bruce, Bundy and Candy.

Since the mid 1990s information literacy strategies have been integrated into many Australian university institutional plans. A report "Developing Lifelong Learners Through Undergraduate Education" (Candy, Crebert and O'Leary, 1994) identified information literacy as one of four essential elements of the undergraduate curriculum.

The Australian Library and Information Association have recently released a statement endorsing the importance of information literacy from a personal, political, economic and global perspective. (<http://www.alia.org.au/sigs/infolit/statement.html>)

In October 2000 the Council of Australian University Librarians (<http://www.caul.edu.au/>) adopted, with two additions, the information literacy standards drawn up by the American body the Association of College and Research Libraries. (<http://www.ala.org/acrl/ilstandardlo.html>)

United Kingdom

Although not as well developed in terms of the US and Australian experiences some important work in information skills has been undertaken. These include the prominence now being given to lifelong learning and the establishment of initiatives

such as the National Grid for Learning and the University for Industry. Government departmental reorganisation following the 2001 general election has resulted in the formation of the Department for Education and Skills. A Learning and Skills Council was established in April 2001, with responsibility for post-16 education.

Key Skills were introduced in primary and secondary schools as part of the National Curriculum in 1995. A Key Skills qualification for post-16 level was introduced in September 2000.

The SCONUL Information Skills Task Force (1999) has explored the position and content of information skills within higher education. It has identified a set of seven headline skills, from which a model has been developed. These skills describe the ability to:

- recognise a need for information
- distinguish ways in which the information 'gap' may be addressed
- construct strategies for locating information
- locate and access information
- compare and evaluate information obtained from different sources
- organise, apply and communicate information to others in ways appropriate to the situation
- synthesise and build upon existing information, contributing to the creation of new knowledge.

The use of these skills forms an iterative pattern, and progression is made through practising these skills. It is expected that undergraduates will use the first four skills in their first year and then progress. The seventh skill is more applicable to postgraduate and research students.

Findings from research carried out in the US and Australia are also reflected in work in the UK, and include the following features:

- Libraries have a role in information skills training which goes beyond that of bibliographic instruction.
- For information skills programmes to be successful a collaborative approach by all involved in the process must be adopted. This includes library, computing, and academic staff.
- Information skills should be integrated into the curriculum rather than be taught as a separate entity.
- Information skills programmes provide a means for library and information service staff to engage in continuing professional development.
- Student attitudes need to change from a mentality of doing the bare minimum required to pass, to recognising the long-term value of the skills that are on offer to them.

Conclusion

It is clear from the audit of information skills provision discussed below that there is a great deal of activity in this area in both higher and post-16 education institutions in the UK. However, there is very little literature published to reflect this activity, particularly in comparison to that in the US and Australia. The material produced

from these countries provides useful reference points and a sound basis for the further development of information skills programmes in the UK.

3.1.2 Literature review update, June 2002

Following the completion of the original literature review at the beginning of the project, a second bibliography of information skills material has been constructed. Due to the amount of material which has been included, and the time constraints of the project, it has not been possible to produce a second, exhaustive review of the literature. This overview is intended to update some of the themes which were identified in the original review.

As stated in the original review, there is still only a relatively small amount of published literature which relates to the UK experience of information skills, whereas there is considerable material relating to the US and Australia. Much of the literature describes the approaches to the introduction of information literacy programmes adopted by individual institutions. A number of the ideas discussed in the first review, such as the need for collaborative partnerships and the status of librarians within the academic sphere remain evident, as do issues such as the integration of information skills into the curriculum, how to provide services for distance learners and the use of online technologies.

The question of terminology has not been resolved, nor has a definitive definition of information skills been agreed upon. Generally the US and Australia continue to use the term information literacy and the UK refers to information skills. Again there is evidence of crossover between the two and indeed Dunn (2002) uses the phrase information literacy skills.

As noted above, the need for good relationships between all those involved in the information literacy process has also been reiterated. In order for information skills to be integrated into the curriculum librarians need to collaborate with academic staff. However, as Webber and Johnston (2000) state:

Since the majority of information literacy initiatives are being led by librarians the learning may not be integrated into credit bearing classes. Librarians' sphere of influence may be limited in comparison with that of academic staff and thus information literacy itself may be marginalised and trivialised, both by faculty and by students.

There are examples in the literature of where successful collaboration has been achieved. As a result of their collaborative experiences with faculty members Dorner et al. (2001) advise "continuous but not continual communication is an important factor in a successful collaboration". They go on to describe a 'tiered' approach which has been adopted for nursing students at Ball State University where skills are developed year by year. The connection between information literacy, lifelong learning and the development of professional skills is clearly recognised. This link with professional skills is also made by Abbott and Peach (2000) in their description of a programme for psychology students at Griffiths University in Queensland. Despite such examples it is clear from the literature that overall information skills provision still tends to be limited and isolated to particular subjects or courses.

Dunn (2002), Seamans (2002) and Manuel (2002) describe studies of students' information skills and the way they interact with information. All highlight the reliance students have on using the Internet rather than other sources of information, with remote access being one reason for this. Seamans in particular provides evidence of

the limitations of student skills in this area and their lack of awareness or concern about this.

A number of Australian institutions have adopted a range of 'graduate attributes' which they expect students completing their studies to possess. Nimon (2001), Bridgland and Blanchard (2001) and George et al. (2001) state that these attributes are taken into account when planning information skills programmes.

The issue of 'learning outcomes' is also raised in the literature, particularly in light of the adoption of the Information Literacy Standards devised by ACRL and CAUL. However, the validity of measuring students' information literacy levels in these terms is raised by Nimon (2001). She states:

...the standards are composed to judge effectiveness and efficiency from the perspective of someone who knows the resources available and what may potentially be used. Thus the basis of judgement of 'correct' response assumes that the task requires such an exploitation, that the student aspires to the use of the full range of information available and that relevant information is held within the systems. As these assumptions may not be right, then any assessments based on them will be fallacious. The competency standards will only be useful where the task requires the student to undertake an efficient literature search and lecturer, librarian and student are agreed that this is what the task in this instance is.

The need to include students in any collaborative partnership has been drawn out by Hartmann (2001), George et al. (2001) and Drew, Abbott and Orr (2001). However, the increase in the number and different types of non-traditional students, coupled with additional pressures on students generally, means that this may be difficult to achieve. Nimon (2001) highlights the fact that the changing profile of students and the increased demands on them, such as working to support themselves and a family whilst studying, means that many are only interested in or able to do the minimum required to pass a course. The need to engage with students and to impress on them the importance of information skills acquisition is still therefore of the utmost importance.

The question of who trains librarians in their role as trainers is raised by Peacock (1999, 2000) who states that this issue has to be addressed if librarians are to be treated as equals during the collaboration which underpins effective information literacy programmes. This theme is echoed by Mitchell (2001). Again concern is raised over the skills that librarians themselves need in order to deliver information skills training successfully to users. Goulding (2001) suggests that some change in the curriculum at Loughborough University is discernible and highlights the need for members of the profession to engage in continuing professional development in order to ensure they retain relevant skills. Nimon (2001) and George et al. (2001) highlight the need for skills updating and continuing professional development for academic staff in order to successfully include and deliver information literacy training in their programmes.

The literature cited in the original review describing the Australian experience of information literacy made some of the most explicit references to the link with lifelong learning. This has been built upon in subsequent articles and the relationship between information literacy, lifelong learning, the economy and social wellbeing is highlighted by a number of authors including George et al. (2001) and Bridgland and Blanchard (2001).

Much of the literature continues to explore how individual institutions are implementing information literacy programmes. Such literature highlights the need for collaboration between faculty members, librarians and others involved in the process in order for them to be effective. Attention is also paid to the content of courses, modes of delivery and the question of integration of skills into the curriculum, as well as the problem of ensuring that all students receive some instruction (Fowler and Dupuis, 2000; Rosen and Castro, 2002). As identified in the original literature review there is continued support for the idea that information skills training should be integrated into the curriculum. This concept is developed further with the idea that these skills need to be subject specific rather than generic, gaining more support (Nimon, 2001; Drew, Abbott and Orr, 2001).

A number of articles deal with the delivery methods of information skills training. Gutierrez and Wang (2001) compare the use of print and electronic workbooks in information literacy instruction. Interestingly, the results reveal that the means by which students are taught information skills appears to have very little impact on their performance. Those students who used the paper workbook felt that they learnt better as a result of having personal contact with their instructors. However, their test results were no different from those who had followed the electronic version. According to the study the most influential factor in improving student skills was the frequency with which students used the library. Those who used the library extensively showed the greatest skill levels. Churkovich and Oughtred (2002) found that in post-tests those students who had face-to-face instruction fared better than those who had followed an electronic tutorial.

Dewald et al. (2000) address the issue of designing information literacy programmes for distance learners and consider some of the difficulties associated with computer-based methods. They conclude that “distance library instructors have a growing variety of technologies from which to select, and they need to consider not only the technical feasibility, but also librarian/student rapport and pedagogical objectives. Active learning is no less a pedagogical consideration in the online setting.”

Morales and Roig (2002) highlight the fact that it is important that faculty members are comfortable in the use of new technologies when trying to apply them in designing programmes. Smith and Shockley (2002) state that technology should not be the key driver in the development of courses and that merely purchasing equipment and software is not adequate. A strategic plan for development and technical support are “prerequisites for successful instructional technology innovation”.

This short overview can only provide a brief snapshot of the work being carried out in the sphere of information skills. What is clear is that the importance of information literacy is increasingly being recognised, and more innovative ways of instructing students are being devised. However, it is also apparent that the surface has only just been scratched and that there is a lot more work yet to be done.

Recommendation 1:

That a national forum should be established to promote information skills and to provide support and a consultancy service on all aspects of information skills to the library, academic and student communities. To assist this, the conversion of the Big Blue website, or the establishment of an information skills portal will provide a national resource.

3.2 Audit of Information Skills Provision

In order to obtain a picture of the provision of information skills training in both the higher and post-16 education sectors, an online audit was designed and managed by Priority Research, in collaboration with the project team. This was distributed electronically to the Heads of all Library/Information Services across the HE sector via the SCONUL mailing list and to those in the post-16 sector via the JISC Regional Support Centres (RSCs).

This proved to be successful strategy with regard to HE with a response rate of 63%. However, due to difficulties in distribution additional strategies, such as telephone calls to acquire individual e-mail addresses and a postal survey, increased the response rate from the post-16 sector to a final total of just over 40%. In total, 278 responses were received. A number of additional responses were received after the final deadline for submission, and these were not included in the analysis.

The purpose of the audit was to ascertain who delivered what training, to whom and by what means. The online audit was designed so respondents could make the appropriate selection from the options given in a 'drop-down' box. The paper-based version gave the same options but, in order to keep it to a reasonable length, some questions, such as those requesting demographic data, were omitted.

The largely quantitative nature of the audit was supplemented by a request for comments, which offered the project team an instant insight into the issues and concerns affecting staff delivering information skills training.

The raw data collected was formulated into SPSS files by Priority Research and was then converted into an Access database by the project team for the purposes of analysis.

Recommendation 2:

That a comprehensive, up-to-date contact list of staff, with institutional or library-wide responsibility for information skills, be formulated by the JISC in order better to facilitate communication between and within the higher and post-16 sectors.

4. Audit Results & Case Studies - *Evaluating Information*

4.1 Audit analysis

The full analysis of the audit results is available from the project website at <http://www.leeds.ac.uk/bigblue/progprep110110.htm> Some key findings are outlined below.

- In response to the question "Does information skills training feature in your institutional learning and teaching strategy?":

Yes	No	No Reply/Not Applicable
57%	32%	11%

Of those who replied 'yes' 61% classed themselves as HE institutions.

- When asked whether information skills feature in the library/learning centre's developmental/ strategic plans:

Yes	No	No Reply/ Not Applicable
88%	10%	2%

The negative responses came mainly from institutions in the post-16 sector.

- 55% of respondents stated that information skills sessions are evaluated, with printed feedback forms being the most popular method of obtaining feedback. Again HE institutions gave the highest response rate.
- Very little assessment of skills prior to training is carried out, with almost 70% of respondents stating that no assessment takes place.

Recommendation 3:

That assessments be carried out to examine the baseline skills of students and how these improve over time, following information skills training and the application of these skills to their academic work.

Overall, the results of the audit showed that both library and teaching staff are involved in information skills training, although the extent of the involvement is difficult to gauge. This is due in part to the survey being limited to library staff because the remit of the project was to examine 'information skills for *students*', and also to a lack of awareness on their part of the work that academic staff are carrying out in this area.

Recommendation 4:

That further work be carried out into the nature and extent of information skills work that academic staff are engaged in. In addition the effectiveness of this training should be assessed in instances where this is the sole means of provision for students.

From the comments section several trends were detected. These include:

- Lack or difficulty of provision for distance learners and part-time students
- Variations in provision between subjects and faculties within the same institution
- Development of models and packages for information skills training
- Use of VLEs such as WebCT and BlackBoard for online information skills courses
- Low take-up of sessions by students and by academic staff.

In response to the question of who receives training a number of respondents recorded 'staff' in the 'others' box. Again, it is beyond the remit of this project to assess what level of information skills academic staff have and how they acquire and update these skills. The audit results clearly show that they are involved in information skills instruction and this issue should therefore be investigated further.

Recommendation 5:

That further research be carried out into whether and how academic staff receive information skills training, building on the work of, but looking beyond, the scope of projects such as tRISSt. (<http://www.mmu.ac.uk/ioe/trisst/>).

4.2 Case Studies

As well as establishing a baseline picture of information skills training in the UK, the results of the audit were also intended to provide the team with examples of good practice on which to base the case studies. Many institutions used the 'comments' section of the audit form to explain their information skills training at length, and it was these comments which were elemental in the selection of the case study institutions. Working to the strands identified in the project plan, each potential case study was evaluated to check whether it matched with the themes the project aimed to investigate. For instance, Southport College, where an internally accredited information skills module is compulsory for all first year students, was selected as a case study as it complied with the following strands:

- Strand 5: To evaluate the impact formal assessment and/or accreditation has on the student perception of the importance of information skills training.
- Strand 3: To evaluate and compare the content of information skills programmes within accredited and non-accredited environments.
- Strand 3: To position the role of information skills training within an institutional learning and teaching context.

A full list of case studies and the strands they explore is included in Appendix 2.

Having selected a number of possible studies, the project team then attempted to choose case studies from a variety of institutions to reflect the differing scenarios across post-16 and higher education. For instance, Tamworth and Lichfield College is a small institution which has a modest Learning Resource Centre with few staff. In contrast, the University of Leeds is a large research-led university with 3 main library sites and nearly 200 full-time library staff. By demonstrating what is possible in even the smallest institution the project team hoped to provide realistic examples for all members of the post-16/ HE library and information community.

For each case study, the team aimed to interview staff involved in delivering training, be they library or academic staff, and where possible to see demonstrations of training, particularly where it is delivered online. Additionally, the team aimed to interview students who had been through the training process and any other parties involved in providing training either directly or indirectly. In some cases, as the team did not have direct access to the students to be interviewed, institutions were asked to recruit student volunteers on the team's behalf, with the incentive of £10 paid to them in cash on the day by the team conducting the case study.

As described in the Project Plan, additional staff were drafted in to assist in carrying out the case studies. These were volunteers with an interest in information skills drawn from both the University of Leeds and MMU. By involving staff from outside the project team it was hoped they would bring different and objective perspectives to the process. This also reduced the amount of time spent by the project team on each

case study, allowing more studies to be completed than would otherwise have been possible.

The team agreed that data should be collected in several key areas:

- background on the institution and previous methods of information skills provision
- description of the current provision, including barriers and challenges, how these were resolved or proposed actions for dealing with them
- data from the institution's own evaluation, where available
- student opinion, where available
- future plans and developments

One of the staff who had participated in the visit then wrote up the case study according to a broad template which incorporated the areas outlined above. These were converted by the project team into a format suitable for the web, with a search box and digest of key points preceding the full report.

The case studies were not intended to provide analysable or comparable results. Nor were the project team hoping to find institutions where an entire information skills programme was being delivered in an ideal way. Instead it was hoped to identify institutions that were simply doing something well, be it good evaluation of their programme, an innovative method of delivery or the embedding of training into a curriculum. In identifying and describing such examples, the project would be able to offer tangible, practical demonstrations of what had been achieved by a variety of institutions. In carrying out the case studies the team were equally keen to report the challenges and difficulties the institutions had faced, as well as their successes and achievements.

The full text of the case studies can be found in Appendix 3.

4.3 Library School Survey

As a result of the information gathered from the literature review and received from the audit, the question of 'who trains the trainers?' was raised. This is an issue which has been highlighted in Australia and in particular by Judith Peacock.

It was clear from the audit that library staff carry out a great deal of information skills training through various means and to a diverse range of users. What was not clear was how library staff gain the skills to enable them to carry out this work. It was decided to run a brief audit of Departments of Library and Information Management to ascertain what training, if any, was provided to students to prepare them in their potential future roles as trainers.

As this issue is technically beyond the remit of the original project it was felt that only a short time should be devoted to it. The resultant survey was necessarily basic, a fact which was commented on by some respondents. Paper-based questionnaires were sent to all 17 Departments of Information and Library Studies and 10 responses were received giving an overall return rate of 58%. The survey revealed that although

most courses for undergraduate and postgraduate students include issues relating to learning styles, presentation skills and communication skills, only one respondent stated that course content at both undergraduate and postgraduate includes teaching methods and curriculum design. Anecdotal evidence suggests that there is one other course which also addresses these issues, although no formal response was received from the institution concerned.

As Peacock (1999) states:

Libraries, library schools and professional associations must combine to address the needs of librarians who teach in academic institutions. Librarianship course curriculum should be modified to include pedagogical foundations of education and guidance on delivery techniques. Ultimately, the educational role of the librarian must be acknowledged and the “teaching of teaching” given a priority.

In fact it is not just those who enter the sphere of academic librarianship who need to be concerned with training skills. Any information-related employment is likely to include some degree of user training – whether it is on an informal, ad hoc basis or as part of a more formalised process.

Recommendation 6:

That further work be carried out into the question of who “trains the trainers”, and also into where providers of library and information management education and employers perceive the responsibility lies for work in this area.

Recommendation 7:

That the theory relating to information literacy is included in the core curriculum for undergraduate and postgraduate courses in the area of information and library management.

In the US the Institute for Information Literacy runs an ‘Immersion’ programme, which is an intensive four-and-a half day training and education programme designed to give librarians the opportunity to consider all aspects of information literacy. (<http://www.ala.org/acrl/nili/immersion.html>)

Proposals for a similar programme to be established in Australia have been put forward. (<http://www.alia.org.au/groups/infolit/>)

Recommendation 8:

That investigations be carried out to evaluate the establishment of a programme of professional training, such as Immersion, in the UK.

5. Taxonomy, Models & Key Skills - *Adapting Information*

The results of the literature review and audit led to the development of the taxonomy and a set of theoretical models, and to a consideration of the Key Skills framework. In adapting and collating the findings, the team identified a significant cultural divide between the delivery and content of information skills within the Key Skills framework, and the more commonly taught subject-based information skills delivered across the HE sector.

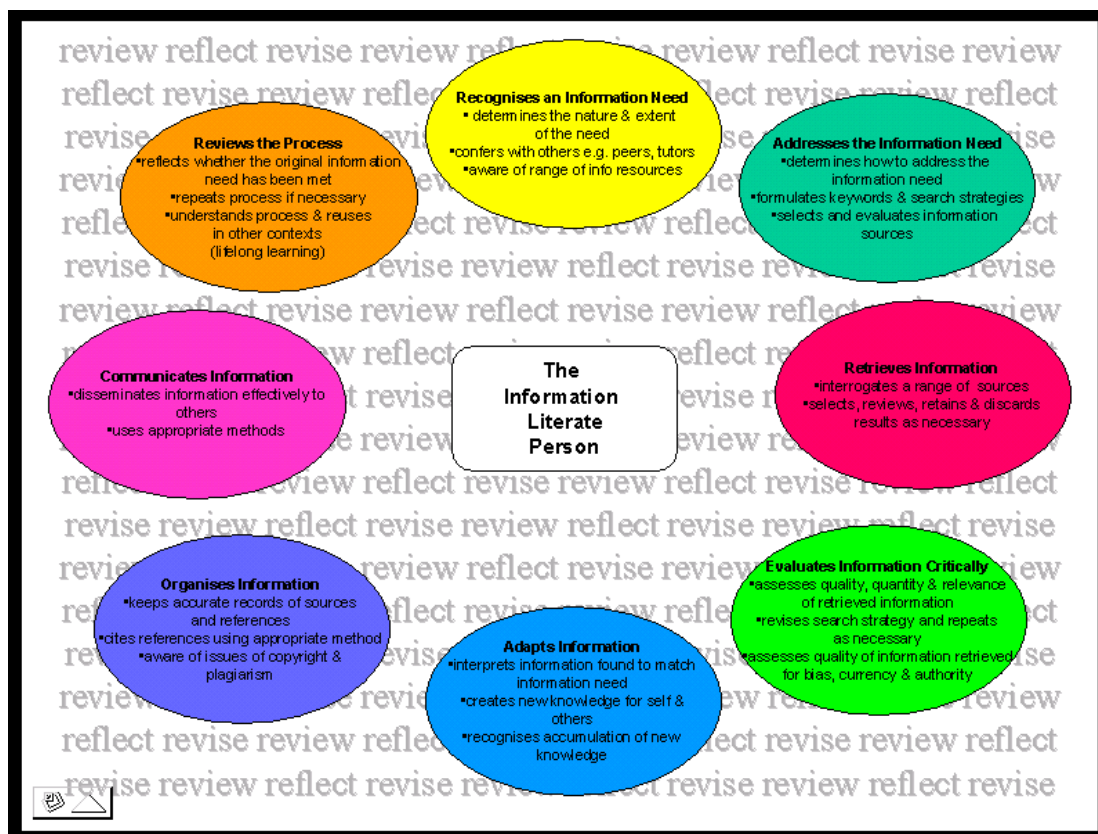
5.1 Taxonomy

The taxonomy was developed as a tool to identify and classify the key features that characterise the acquisition of information skills. These are most often defined in terms of the attributes of an information literate person. The table below is an abridged version of the full taxonomy which is provided as Appendix 4. The taxonomy was adapted from information gathered during the literature review stage and presents lists of attributes drawn up by some of the key authors in the information literacy field, as well as the standards developed by bodies such as ACRL, CAUL and SCONUL. Certain skills can be seen recurring, and where possible attempts have been made in the table to group like concepts together across the skill levels. There are clear areas of commonality across different lists, such as the "recognition of an information need". Some terms, such as "recognise", "access" and "evaluate" are used consistently, revealing some similarities in the use of language. At the same time, there are key differences such as "evaluates" and "evaluates critically" which raise questions about the exact nature and depth of the skills to be acquired. In addition, there are extra skills included by some authors and not others.

	Doyle (1992)	SCONUL (1999)	ACRL (2000)	CAUL (2000)
Information skills / competency standards	Recognises the need for information	Recognise a need for information	Determines the nature and extent of the information needed	Recognises need for information and determines the nature and extent of information needed
	Recognises that accurate and complete information is basis for intelligent decision making			
	Identifies potential sources of information	Distinguish ways of addressing the information gap	Accesses needed information effectively and efficiently	Accesses needed information effectively and efficiently
	Formulates questions based on information needs	Construct strategies for locating information	Evaluates info. and its sources critically and incorporates selected info. into his or her knowledge base and value system	Evaluates info. and incorporates into knowledge base and value system
	Develops successful search strategies			
	Accesses sources of information including computer based and other technologies	Locate and access information		Classifies, stores, manipulates and redrafts information collected or generated
	Evaluates information	Compare and evaluate information obtained from different sources	Individually or as a member of a group, uses information effectively to accomplish a specific purpose	Expands, reframes or creates new knowledge by integrating prior knowledge and new understandings as an individual or member of a group
	Organises information for practical application	Organise, apply and communicate information to others in ways appropriate to the situation	Understands many of the economic, legal and social issues surrounding information use and accesses and uses info. ethically and legally	Understands cultural, economic, legal and social issues surrounding information use and accesses and uses information ethically, legally and respectfully
	Integrates new information into an existing body of knowledge	Synthesise and build on existing information, contributing to the creation of new knowledge		Recognises that lifelong learning and participative citizenship requires information literacy
	Uses info. in critical thinking and problem solving			

5.2 Information Skills Models

Drawing from the taxonomy and other work carried out in defining information Literacy, a model of an information literate person was devised. This comprises 8 characteristics:



(Also provided as Appendix 5.)

Each of these characteristics represents an activity in the information seeking process and is qualified by a number of more detailed statements. The backdrop to the model has the terms "review, reflect, revise" as continuous threads which weave their way across all the information seeking skills activities.

The model is designed so that each activity can be applied across all skills levels, from a simple information request, such as finding out train times, to a complex search using a number of different sources.

In addition, the team adapted information gathered specifically relating to information skills training within the post-16 sector to develop a second model. This highlights the aspects of information skills found in the Key Skills framework at levels 1-4. See Appendix 6. As a result of the audit findings, the Key Skills agenda and place of information skills teaching within this were examined in more detail at this stage.

The project team recognises that the models suggested are relatively 'flat' and would benefit from further developmental work. Some initial exploration was carried out in mapping skills from the models to various sets of performance indicators which have

been produced, most notably the Information Literacy Standards drawn up by the Association of College and Research Libraries in the US, later adopted, with some amendments, by the Council of Australian University Libraries. Although the match between the features of the information literate person described in the model and the standards was good in some areas, there were gaps in others which would need to be addressed in order to achieve parity across the model.

Recommendation 9:

That further work into the establishment of standards and performance indicators in information skills should be carried out.

5.3 Key Skills and Information Skills

In theory, the national qualification framework in Key Skills provides a home for information skills to be taught within post-16 (non-HE) education. The specification of these Key Skills is outlined by the Quality Curriculum Authority at:

<http://www.qca.org.uk/nq/ks/main2.asp>

Key skills are described as "generic skills which individuals need in order to be effective members of a flexible, adaptable and competitive work force and for lifelong learning".

(Department for Education and Skills website: <http://www.dfes.gov.uk/key/back.shtml>)

The Key Skills qualification has only been in wide usage since September 2000 and continues to be under review. The units of IT and Communication, both compulsory key skills, include skills which are found in models of information skills. The Post-16 Toolkit (see section 6.1.2) is designed to highlight these.

In many ways, the existence of the Key Skills framework provides a much more developed structure for the teaching of information skills than found in the HE sector. However, the results of the survey of current practice in information skills teaching revealed a number of concerns about the extent and quality of teaching in this area in post-16 education, and a wide variety of practice across schools and colleges. These issues are highlighted below. It should also be noted that it was difficult to establish a picture of information skills training in the post-16 sector because of the wide variety of practice and the different types of staff delivering the training, both of which had an impact on the relatively low return rate of the audit questionnaire.

The first issue of concern is that information skills are not recognised in their own right. This has a substantial impact on the success of their teaching, as it results in a lower status for information skills than the recognised Key Skills. As the skills described as "information skills" span 2 components, they may be lost between the two. Those appearing in the IT unit are often equated to IT skills and therefore swallowed up by the technology. This results in a lack of awareness of the existence and importance of information skills by students and tutors. It may also lead to a lack of effective teaching of these skills, as it relies on the Key Skills co-ordinators for both IT and Communication to recognise and understand information skills and be able to train others to acquire them.

Recommendation 10:

That the position of information skills within the Key Skills framework be examined during the next review (due 2003-4) and be added either as a separate qualification or as a recognisable section of another unit (e.g. an Information Literacy unit, encompassing IT and information skills).

This leads to the second issue of concern which relates to library / Learning Resource Centre staff. The lack of recognition of information skills in their own right provides a barrier for LRC staff to provide training, despite the fact that they are often best placed to do this, having the knowledge, expertise and training required. However, as there is no clear link between Learning Resource Centres and Key Skills, it is difficult for LRC staff to become involved with information skills teaching. Though many LRC staff have found alternative routes to providing students with these key skills, information skills are then often not embedded in the curriculum. Given the existence of the Key Skills framework which provides a suitable and relevant place for information skills teaching, it is vital that LRC staff become involved in or have an influence on the teaching of Key Skills.

Unlike their HE colleagues, post-16 LRC / Library staff are also hindered in providing information skills training to students by a lack of acceptance of their role as teachers. Some LRC staff have taken teaching qualifications in order to raise their status in this area. In most cases, LRC staff involved in teaching, have to stress the training / facilitating nature of the role, in order to avoid the notion that they are "teaching". This lack of flexibility in staff roles presents another barrier to LRC staff in delivering information skills and goes some way to explaining the different levels of provision occurring in the post-16 and HE sectors revealed in the survey of current practice. In addition, the other main barriers to LRC staff providing training are lack of time and funds.

Recommendation 11: (see also Recommendation 6)

That the resistance to Learning Resource Centre staff in the post-16 sector teaching be addressed through a review of the role of LRC staff by the JISC or through CILIP, with the aim that Learning Resource staff are accepted as part of the Key Skills teaching team.

Recommendation 12:

That the Key Skills Support Programme is encouraged to include information skills more explicitly in its documentation, training and events, and to consider the role of Learning Resource Centre staff within the Key Skills programme.

A further issue relating to Key Skills and relevant to an examination of information skills teaching at post-16 level is proxy qualifications. In order to minimise the burden of assessment on students and tutors, a system of proxy qualifications operates for Key Skills, which enables students to be exempt from assessment where appropriate. For example, a GCSE A*-C grade in Computer Studies, IT, ICT or Information Systems exempts students from taking assessment at Levels 1 and 2 IT unit for Key Skills. A GCSE A level A-E grade in Computing, IT or ICT exempts students from taking assessment at Levels 1-3. However, the lack of recognition of information skills within both sets of qualifications may result in these skills being bypassed.

Recommendation 13:

That the system of proxy qualifications relating to Key Skills be examined in detail, to establish the level of information skills achieved by students who bypass the Key Skills units in IT and Communication.

In practice, therefore, the Key Skills framework does not guarantee the teaching of information skills within the post-16 sector. The framework can be adopted in different ways, resulting in a variety of practice and patchy coverage. The audit and

case study visits highlighted the lack of a common approach and significant differences in the quality of teaching. In the long term, a lack of information skills teaching will prevent students becoming effective independent lifelong learners, one of the key aims of the Key Skills programme. The fact that some information skills are included but can be bypassed may give students and tutors the false impression that these skills have been acquired.

6. Toolkits & Bibliography - *Organising Information*

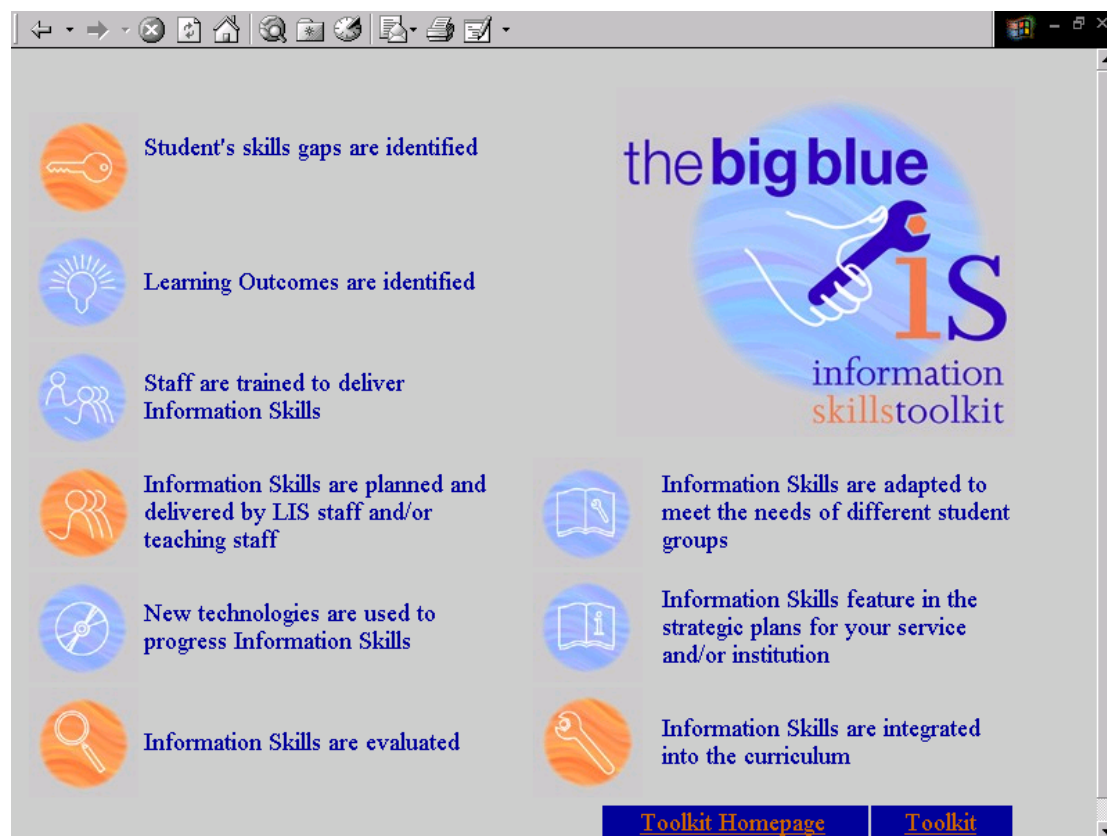
6.1 The Information Skills Toolkit and the Post-16 Toolkit

The toolkits were developed from a model of information skills which identified the key characteristics of a successful information skills programme. It became clear that to be useful to library and teaching staff it needed to incorporate practical examples and links to relevant resources. Thus, the idea of a 'toolkit' for information skills was conceived.

6.1.1 The 'Information Skills Toolkit'

The project has a wide range of deliverables, most of which are intended to be used by the post-16/ HE community. However, by having these resources simply sitting on separate pages on the website, it seemed possible that it would not be clear to users how they could be productively used or how they fitted together to form a coherent source of support for information skills. The toolkit would bring these resources together to ensure that they were accessible and useable.

The Toolkit identifies nine features of a successful information skills programme.



Each section begins with an explanation of the feature and reasons for its inclusion in an information skills programme. There are then links to relevant case studies, lists of resources identified by the literature review (with links if available online), and links to sites from the 'Links' section of the project website (these connect to projects, online courses, standards and other information that the project team have discovered). It is hoped that together these resources provide inspiration, support, and motivation. The case studies in particular provide a proven example of the feature in practice in a real UK institution.

The following scenarios demonstrate how the project team anticipates that the toolkit might be used.

- *Scenario 1: The Head of a LRC in a small post-16 college wants to develop learning outcomes to focus their information skills training.*

The toolkit contains a section entitled "Learning Outcomes are identified". This section contains brief information on why learning outcomes are important and how to decide which learning outcomes are suitable for your student population. There are also links to online courses that have included learning outcomes and links to case study institutions such as South Bank University and Southport College which demonstrate practical applications of learning outcomes and the impact they have on information skills training.

- *Scenario 2: A member of LRC staff who delivers information skills training wants to start evaluating the programme, or encouraging students to evaluate their skills.*

This user would turn to the section of the toolkit entitled "Information Skills are evaluated". This section includes an explanation of the value and importance of evaluation and the issues to consider when undertaking evaluation, such as deciding what kind of data you want and how it will be collected and processed. This section also lists less obvious benefits of doing evaluation, such as using positive evaluation to support funding bids or to get information skills embedded into the curriculum. Finally, there is a link to a case study from the University of Aberdeen where pre and post self-assessment has been carried out to encourage students to track their progress and see the value of attending information skills training.

- *Scenario 3: A Head of LRC wants information skills to be recognised outside the LRC, e.g.: by college managers and academic staff.*

This is a key challenge for many institutions, and an important first step in providing effective training that students will be motivated to attend and that can be embedded into the curriculum. The section of the toolkit entitled "Information Skills feature in the strategic plans for your service and/ or institution" provides statistical information from the project's audit on what percentage of institutions currently have information skills in their service or college plans. There is a list of reasons to include information skills in such plans, suggesting that inclusion in LRC service plans can act as a springboard to inclusion in college plans. There is also a link to some characteristics developed by the American Association of College and Research Libraries which illustrate best practices of information skills programmes- a useful source of inspiration when trying to demonstrate the value of information skills training.

As the above examples show, the toolkit will hopefully provide information skills trainers with a starting point in planning and providing a new service or programme,

and will be a resource they can return to again and again for support, ideas or motivation.

The structure and format of the toolkit is designed to enhance the idea that the toolkit is just what it says- a set of tools to help users do their job. The opening page explains the aims and content of the toolkit and then leads users on to the 'homepage' where the features are listed. Users simply click on the feature they are interested in to go to the information and resources on that feature. The toolkit can be printed in PDF format, but it is primarily a web-based resource that is designed to be used online. The design of the toolkit was contracted out to staff in the Graphics Unit at Leeds University who were able to create a look that used the idea of a 'toolkit' in a practical rather than novel way. (See Appendix 7.)

6.1.2 Post-16 Toolkit

The post-16 toolkit highlights the aspects of information skills found within the Key Skills framework at levels 1-3. This is then taken further by including information on how the statements can be interpreted in practice and examples from the case studies. Comments from the Key Skills Support Programme are also included. The toolkit's statements are taken directly from the QCA's Key Skills specifications (as revised September 2000) for the IT and Communication units. The toolkit aims to demonstrate how information skills training can be included in the post-16 curriculum using the Key Skills framework and to provide ideas and evidence of this.

The following scenario demonstrates how the post-16 toolkit might be used:

- *Scenario: A large post-16 college has a strong Key Skills structure which is well attended and valued by students. LRC staff want to integrate information skills into the curriculum but don't know how.*

The toolkit draws on two Key Skills units, 'Information Technology' and 'Communication'. The QCA Framework identifies skills for these units that LRC staff would consider to be information skills, such as "collate and organise information gathered to use in discussions or written material" and "find different types of information from IT and non-IT sources". The LRC staff can use this evidence to make a case for including such skills into Key Skills sessions and offer to teach them. The case study at Tamworth and Lichfield College could be used as evidence that such skills can be successfully taught by LRC staff.

Feedback on the toolkit from delegates who attended a Big Blue session at the UCR/CoFHE conference indicated that such a document would be a useful tool for them to promote information skills within their colleges and to demonstrate how they could support Key Skills. It is hoped that the post-16 toolkit will assist staff in highlighting the need to integrate information skills training into the curriculum, as well as providing practical examples of how this can be achieved.

6.2 Bibliography

Following on from the original literature review carried out at the start of the project, the project team compiled and continued to update a bibliography of material relevant to the topic of information literacy. Searches have been carried out, predominantly through LISA: Library and Information Science Abstracts, but also through alerting services set up through the British Library (ZETOC) and through Emerald/MCB Press. Similar criteria have been used in the selection of material as were originally applied in order to maintain a degree of uniformity. These include:

- Concentration on literature from the US, Australia and the UK.
- Selection of literature which deals particularly with higher education.

The bibliography contains more than 100 references in addition to those originally selected for the literature review. These include conference papers and online articles as well as print-based book and journal resources. This material formed the basis for the update to the literature review included in Section 3 of this Report.

As was originally the case there is far more material available which outlines experiences of information literacy programmes in the US and Australia than in the UK. Again, references to the post-16 sector in the UK have again been difficult to find.

It should also be noted that the material available on this issue is much more wide-ranging than that selected for inclusion, which was necessarily restricted by the terms of the project. There was a significant amount of material from other countries, such as Canada and South Africa, and on dealing with information literacy instruction in schools, medical training and commercial settings.

7. Website & Dissemination - *Communicating Information*

7.1 Project Website

The project plan stated that the Big Blue website would include "bibliographies, progress reports, contact details of the project team, links to other sites and a timetable of project milestones". While this initial brief provided a framework to get the site up and running, it has since exceeded these initial expectations. The site went live in July 2001 at <http://www.leeds.ac.uk/bigblue> and has developed over the course of the project. The basic website structure was developed by the project team and the construction and maintenance has been the responsibility of one of the project's research officers.

The focus of the website has evolved throughout the project. Initially the site simply gave basic information about the aims and plans of the project. Once the results of the audit were complete, the focus switched to providing access the project's deliverables as they became available. Towards the end of the project the focus has been promoting the project's achievements and publicising the project deliverables at dissemination events.

The site hosts all the key deliverables of the project, including:

- the UK and rest of world literature reviews and bibliography, with full text links to sources where available
- the taxonomy of information skills
- models of information skills for both post-16 and HE
- case studies, which begin with a 'pop-box' style summary with links to the full text and which are searchable
- the 'Information Skills Toolkit' which brings together the above resources in a practical and relevant manner
- results of the audit with graphical interpretations of key findings

As well as hosting the key deliverables of the project the site has also developed an area of links to related projects, to sites with online information skills training programmes and to those with more general information, guidelines or relevant research. Members of the project team have regularly received requests from institutions from as far away as Australia to be included in this section of the site. This section in particular will need regular maintenance and updating if it is to continue to be a useful resource.

The website has also been used to share information between the project team and to deliver information to the project steering group via the 'password protected' section. This has allowed documents such as meeting agendas, minutes, progress reports and draft versions of deliverables to be privately shared between team and steering group members. The site includes feedback mechanisms including an online form and extensive contact information for all the project team and steering group members.

Recommendation 14: (see also Recommendation 1)

That the website should be maintained and developed to become less a project website and more an information skills portal that would provide a 'one stop shop' for users seeking quality information and resources.

7.2 Dissemination

The community that the project serves is a very large and geographically diverse one, so it was clear from the outset that taking advantage of dissemination opportunities would be essential to ensure that the project's deliverables would reach the widest possible audience. Throughout the project's duration, members of the project team have taken part in events around the country to promote the work of the project, including:

- IT and ILIT conference, Glasgow, March 2002
- UCISA TLIG conference, Leeds, April 2002
- UC&R/ CoFHE conference, Bath, April 2002
- JISC RSC events in Belfast, Bristol, Leeds and Wolverhampton

At these events, a variety of methods were used to both present information about the project and to obtain feedback and information about what the community feels they need to improve information skills training. For instance, at the IT and ILIT conference, delegates were asked to write their needs on post-it notes which they stuck on a flip chart sheet, and at UCISA TLIG, delegates were asked to imagine themselves in the role of students, academic staff, IT support staff and library staff and think about information skills training from these perspectives.

In addition to these events, the project team organised events in Glasgow (with the Citiscapes project), Manchester, Leeds and London to promote both the project and information skills in general. An event in Sheffield will take place in August 2002.

The findings of the project will also be disseminated to the community via the publication of an abridged version of this report which will be sent to all UK post-16

and HE institutions. This version of the report will contain URLs for pages from the project's website where more in-depth information can be found.

Finally, a press release promoting the launch of the toolkit was sent out in July 2002 to library and education publications. The project has also been briefly described in several JISC RSC newsletters, *Library and Information Research News* (LIRN) and the *CILIP Update*. A fuller article on the project has appeared in the *SCONUL Newsletter* and a further one for this publication is planned. Another article is planned for the *New Review of Academic Librarianship*.

8. Conclusions - *Reviewing the Process*

The review stage of the process is one which is not given much coverage within the various conceptions of the information literate person yet it is one of the most valuable. If we do not review what we have done and reflect upon our achievements and failures then it is questionable whether we can say we have learnt anything at all by passing through the other, earlier stages. The project team feel that it is this aspect, clearly stated, that makes it unique and different from other work that has been carried out in this area.

The compilation of this report along with planning for the various dissemination activities has formed the basis of the review of the work carried out and the means by which it was achieved.

The project team feel that the aims outlined in the project plan have been met and that this work has added value to the debate surrounding the subject of information skills training. However, the review process has also served to highlight a number of issues of concern that have presented themselves throughout the project.

Key amongst these has been the sheer size of the task which became apparent only after the initial work of the project had been carried out. The differences between the higher and post-16 sectors in terms of size, experience, personnel and resources only became apparent when the audit was undertaken. At this time a decision was made to divide the project into two separate strands with Leeds University dealing primarily with the post-16 sector and MMU with HE.

The Big Blue has set the context for future work relating to information skills. Its findings should be seen as essentially preliminary. As such its merit lies in highlighting the type of issues which need to be considered and in indicating a number of ways forward. The model of the information literate person provided a robust framework for the work carried out by the project team, and, as this was intended to be an iterative model, it could be applied to future developments. Underpinning this is the need to review, revise and reflect. It is through these principles that information skills training will become better established in the UK.