An investigation into the information literacy skills developed by

final-year students in the University of Sheffield

A study submitted in partial fulfilment of the requirements for the degree of Bachelor of Science in Information Management

By

020177074

May 2005
Abstract

This dissertation presents and discusses the findings of the research project which investigates and assesses the information literacy skills developed by final-year students in the University of Sheffield. Since major information literacy assessments focus on the whole undergraduate or postgraduate students groups, an information literacy assessment which mainly focuses on final-year students is needed.

A literature review has been provided in the dissertation to demonstrate the importance of information literacy skills in the workplace, to introduce how higher education institutions help students develop information literacy skills and to discuss the findings from previous information literacy assessments.

A set of quantitative and qualitative data was collected from questionnaire and telephone interview survey. The findings revealed that students have extremely positive attitudes towards information literacy skills and are capable of identifying information needs, locating information through multi-channels, organising and using retrieved information whereas they are weak at evaluating retrieved information and preparing correct bibliographic reference.

The author concludes that information literacy skills have been embedded as a part of many courses in the University of Sheffield whereas more training should be provided by the university to improve students’ information literacy skills, especially skills to effectively evaluate retrieved information.
I would like to deeply thank my project supervisor, Professor Sheila Corrall, for her endless support and invaluable comments to improve my work and my written English. Without her help, I will not be able to learn so many things which are invaluable for my future PhD study.

I also appreciate Dr Ian Lilley in the Department of Automatic Control and Systems Engineering and Ms Anouck Guinchard in the French Department for their help and permission to enable me to hand out questionnaire to students in the tutorial.
List of Contents

Abstract.................................................................................................................. I
Acknowledgement........................................................................................................ II
List of
Contents.................................................................................................................. III
List of
Charts.................................................................................................................... VI
List of
Tables.................................................................................................................... VII
List of
Figures................................................................................................................... VIII

Chapter One: Introduction....................................................................................... 1

1.1 Background of study....................................................................................... 1

1.2 Problem statement......................................................................................... 1

1.3 Research aims and objectives........................................................................ 2
An investigation into the information literacy skills developed by final-year students in the University of Sheffield

Chapter Two: Literature Review

2.1 Competencies and associated skills of information literacy
2.2 Information literacy in the workplace
2.3 Information literacy programs in the higher education
2.4 Information literacy assessments and findings
2.5 Summary

Chapter Three: Research Methodology

3.1 Research approach
3.2 Research methods
3.3 Designing the survey
Chapter Four: Questionnaire Results and Discussions

4.1. Students’ backgrounds and experiences on searching for information

4.2. Students’ attitudes towards information literacy skills

4.3. The resources students use to collect information
4.4. The standards students adopt to evaluate retrieved information

4.5. Bibliographic reference test

Chapter Five: Interview Results and Discussions

5.1. How students identify and refine information needs

5.2. How students record and manage retrieved information

5.3. How students synthesise retrieved information to form their own arguments

Chapter Six: Conclusion, Recommendations and Further Research

6.1. Conclusion

6.2. Recommendations and further research
An investigation into the information literacy skills developed by final-year students in the University of Sheffield

Bibliography ..............................................................................................................................29

Appendix 1:
Questionnaire ......................................................................................................................31

Appendix 2: Pilot
Test........................................................................................................................................35

Appendix 3: Covering
Letter.......................................................................................................................................36

Appendix 4: Interview
Questions...............................................................................................................................37

Word counts: 6613
List of Charts

Chart 3.1. Number of students filled in the questionnaire……………………………………...11

Chart 3.2. Number of students participated in the telephone interview……………………………………...12

Chart 4.1.1. How often do students seek and use information………………………………….14

Chart 4.1.2. Have students received information skills training……………………………….15

Chart 4.2.1.1. Whether students feel search for information is a waste of time………………16

Chart 4.2.1.2. Whether students consider information seeking skills are useful……………...16

Chart 4.2.2. Whether students feel it difficult for identifying information needs……………..17

Chart 4.2.3. Whether students feel it difficult for finding information from the Internet and the library…………………………………………………………………………………………..17

Chart 4.2.4. Format of information that students prefer……………………………………….18

Chart 4.2.5. Whether students find it difficult for evaluating information…………………………..18
Chart 4.2.6. Whether students find it difficult for synthesising and using information……..19

Chart 4.3 Resources students use to search for company information………………………...20

Chart 4.4.1 Standards students use to evaluate information………………………………………20

Chart 4.4.2. Information evaluation test…………………………………………………………21

Chart 4.5. Bibliographic reference test……………………………………………………………22
List of Tables

Table 2.1. Summary of information literacy competencies and associated skills………………4

Table 4.1.1 How often do students seek and use information…………………………………..15
List of Figures

Figure 3.1. Three research stages and outcomes........................................7
Chapter One: Introduction

1.1 Background of Study

Information literacy is the term used to describe a number of information-related activities and skills in the higher education. It can be comprehensively defined as “a set of abilities to recognize information needs and access, evaluate and use effectively needed information.” (American Library Association, 1989).

Information literacy has received increasing academic attention since the term was coined by Zurkowski in 1974 (Webber and Johnston, 2000). In the mid-1990s, many universities shifted their curricula towards independent learning and embedded information literacy as one of the fundamental skills in their curricula (Varga-Atkins et al, 2004). In addition universities develop various information literacy programs to foster information literacy skills in students at all levels.

On the other hand, managers in the workplace gradually recognize that the survival and success of companies in the information age “no longer depends on the ability to acquire and convert raw materials, but on the ability to process and use information” (TFPL, 1999). Consequently, companies urgently require their employees to develop information literacy skills and become an information literate person. Individuals, who are capable for processing and utilizing information to facilitate their lifelong learning and make better decisions, manifest stronger competitive advantage in the workplace.

1.2 Problem Statement

Information literacy skill has become one of the most crucial and essential skills for individuals in their academic studies, in the workplace and in their personal lives (ACRL, 2000; CAUL, 2001). Higher education institutions worldwide provide various courses, training sessions and workshops to foster and develop students’ information literacy skills. Assessments of information literacy skill in the higher education are not novel whereas the student groups, which are involved in the assessments, are varied in
different projects. Studies are still needed to assess the information literacy skills developed by final-year undergraduate students who are going to enter the workplace in the near future. Therefore, this research chooses the University of Sheffield as an example (mainly focusing on the Department of Computer Science, Information Studies, Management School, Automatic Control and Systems Engineering and French) to answer the question:

\[\text{What levels of information literacy skills have final-year students developed during their academic life in order to overcome the challenges in their future career?}\]

1.3 Research Aims and Objectives

The aim of this research project is:

\[\text{To investigate and assess what levels of information literacy skills final-year students in the University of Sheffield have developed to capture and process needed information.}\]

The research aims are broken down into four more specific objectives. The following objectives are set up according to five standards: specific, measurable, achievable, realistic and time-related (SMART):

- To examine how final-year students identify and refine information needs for specific tasks.
- To examine whether final-year students locate relevant information from various resources.
- To investigate what standards final-year students use to compare and evaluate retrieved information.
- To examine whether and how final-year students organize, apply and synthesize retrieved information to create new knowledge.
Chapter Two: Literature Review

The literature review aims to help the researcher better understand the subject and generate points for comparison with the findings of the research which strives to answer the question: “what levels of information literacy skills have final-year students developed during their university life in order to overcome the challenges in their future career?” This research question is extended into four more specific questions:

- What specific competencies and skills does information literacy involve?
- Why is information literacy skill important in the workplace?
- How do universities facilitate students to develop information literacy skills?
- What findings have been extracted in previous assessments which examine the levels of information literacy skills developed by final-year students?

The remainder of the literature review therefore contains four sections and aims to sequentially answer these four questions.

2.1 Competencies and Associated Skills of Information Literacy

The initial set of information literacy competencies was developed by the American Library Association in 1989 which indicates four basic competencies possessed by an information literate person: competencies to “recognize when information is needed and to locate, evaluate and use effectively the needed information”.

These basic competencies have been continuously extended and improved by other organizations in many countries, such as the Society of College, National and University Libraries (SCONUL) in the UK, the Association of College and Research Libraries (ACRL) in the USA and the Council of Australian University Librarians (CAUL) in the Australia, which also identify various sets of specific skills associated with each core competency. Table 1 briefly summarizes the most crucial information literacy competencies and associated skills according to the documents provided by SCONUL (1999), ACRL (2000) and CAUL (2001). The competencies and skills
An investigation into the information literacy skills developed by final-year students in the University of Sheffield

summarized below are used as the fundamental of this project to set up research objectives and design questionnaire and interview survey.

<table>
<thead>
<tr>
<th>Core Competency</th>
<th>Associated Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and refine information needs for specific tasks</td>
<td>Identify key concepts, keywords and related terms that describe the information needs;</td>
</tr>
<tr>
<td></td>
<td>Review the initial information need to clarify, revise or refine the question</td>
</tr>
<tr>
<td>Locate relevant information from various resources</td>
<td>Develop appropriate information research strategy</td>
</tr>
<tr>
<td></td>
<td>Identify appropriate resources and methods to collect information</td>
</tr>
<tr>
<td></td>
<td>Identify the benefits and applicability of these resources and methods</td>
</tr>
<tr>
<td></td>
<td>Develop appropriate search techniques (i.e. use of database and Boolean)</td>
</tr>
<tr>
<td>Effectively compare and evaluate retrieved information</td>
<td>Recognize and be able to use suitable criteria to evaluate information (i.e.</td>
</tr>
<tr>
<td></td>
<td>purpose, coverage and currency, etc)</td>
</tr>
<tr>
<td></td>
<td>Aware bias and authority issues</td>
</tr>
<tr>
<td>Organize, apply and synthesize retrieved information to create new</td>
<td>Systematically record and manage the information and its sources</td>
</tr>
<tr>
<td></td>
<td>Create correct bibliography references</td>
</tr>
<tr>
<td></td>
<td>Read and note the main idea of retrieved information</td>
</tr>
<tr>
<td></td>
<td>Recognize interrelationships among concepts and combine them into potentially</td>
</tr>
<tr>
<td></td>
<td>useful primary statement with supporting evidence</td>
</tr>
</tbody>
</table>

Table 2.1. Summary of information literacy competencies and associated skills

2.2 Information Literacy in the Workplace

In the information age, employees are surrounding by huge amount of information from the increasingly complicated internal and external environment.

Employers gradually recognize it is urgent for their staffs to have the skills to process and use information to solve sophisticated problems in the new business environment. As the CEO and chief analyst of Basex, Spira (2005) states that knowledge workers who are capable to capture, utilize and share information and knowledge are the most important asset of the company and the linchpin to an organization’s success. Spira quotes the views of CEOs or presidents from IBM, Xerox, Factiva, Siemens Communication and Microsoft to prove that leaders in many companies consider
knowledge workers as the lifelong learner and knowledge applier and the key to enable companies to play successfully in today’s competitive environment. The research results of TFPL consultant (1999) reveal that individuals who possess strong information literacy skills will be able to make better decisions and feel more comfortable in ambiguous work situations and therefore manifest better competitive advantage in the workplace.

2.3 Information Literacy Programs in the Higher Education

Higher education institutions worldwide have developed various information literacy training programs to foster information literacy skills in students at all levels since the mid of 1990s (Owusu-Ansah, 2003; Varga-Atkins and Ashcroft, 2004). Many universities, as in the case mentioned by Larkin and Pines (2005), incorporate information literacy as “an intrinsic part of the course assignment”. In the cases provided by Grafstein (2002), information literacy has been “embedded throughout the curriculum” and “figured as a central component” of all degree courses. However, a current challenge is that, since the university’s “information environment is linear and systematic [whereas] the work information environment is complex [and] messy” (Lloyd, 2003), the university’s curricula should not just help students develop information literacy skills but also facilitate them to transfer their skills from university contexts into specific workplace contexts.

2.4 Information Literacy Assessments and Findings

Numerous assessments have been conducted in universities to assess the results of information literacy programs and evaluate the level of information literacy skills developed by students. However information literacy assessments conducted by different universities focus on different student groups, from undergraduate students to postgraduate students to students in the whole university. Assessments which mainly focus on final-year undergraduates are rarely found. Therefore in this section, the author can only present some findings of assessments which evaluate information literacy skills developed by undergraduates in all levels. However, after reviewing and analysing the findings presented by Caravello et al (2001), Varga-Atkins and Ashcroft (2004) and Kerins et al (2004), it can be revealed that although the overall information
literacy skills of final-year students are higher than the skills of first and second year students, undergraduates manifest similar problems on identifying, locating, evaluating and managing information regardless their levels.

The report provided by Varga-Atkins and Ashcroft (2004) shows that, students do not consider doing research for an assignment is a waste of time whereas they feel finding information in the library is frustrating and they cannot find what they need in the library without help. Varga-Atkins and Ashcroft argue that students’ negative feelings and attitudes towards information skills can affect their ability to acquire and use information. Caravello et al (2001) and Chambers (2002) reinforce that students who have undertaken formal information literacy trainings possess more positive feelings towards information skills and are more confident to search for information. In addition Varga-Atkins and Ashcroft declare that students are capable for identifying suitable keywords to represent their information needs and locating information through various resources. However both Varga-Atkins and Ashcroft and Caravello et al state that undergraduates still lack skills to properly use Boolean searching, effectively evaluate information and correctly prepare a bibliographic reference which means the quality of information retrieved by students might be poor and they might have difficulties for managing retrieved information.

2.5 Summary

Information literacy skills which concern accessing, evaluating, synthesizing and using needed information are recognized as the crucial skills required in the workplace. Universities worldwide have rendered various information literacy programs to help students develop suitable information literacy skills to overcome challenges in the new environment. On the other hand, information literacy assessments reveal that undergraduate students have developed appropriate information literacy skills for identifying information needs and locating information through multi-channels whereas they still lack skills for evaluating retrieved information and create correct bibliographic reference.
Chapter Three: Research Methodology

3.1 Research Approach

In accordance with the nature of the research topic, this research project strives to collect and analyse a set of primary data to build up theories on information literacy skills developed by final-year undergraduate students. Therefore the inductive rather than deductive approach has been adopted in the project. In addition, since inductive approach emphasizes gaining a close understanding of the research context (Saunders et al, 2003), it is well suited to the studies of information literacy skills which involve inevitable interactions with its context.

3.2 Research Methods

This research consists of three stages and adopts multiple data collection methods (as shown in Figure 1). Both quantitative and qualitative methods have been used in the research to generate in-depth and triangulated data.
The Literature Review

An extensive review of literature on information literacy in the higher education and in the workplace has been conducted as the first stage of the research. The literature review does not just provide an overview of the context in which the study involves, but also summarizes the findings of previous research on information literacy skills developed by final-year students which can be used to compare with the results derived from questionnaire and interview data to build up new theories for the topic.

Questionnaire

As stated by Saunders et al (2003), questionnaire requires the respondent to answer the same set of standardized questions in the same sequence and can efficiently collect large amount of data. Therefore it is considered as the most appropriate quantitative method in the second stage of the research which strives to collect large amount of quantitative data to discover the variability in the attitudes of final-year students towards information literacy skills, the resources they use to collect information and the standards they adopt to evaluate retrieved information.
Interview

The third stage of the research intends to collect in-depth data to answer a set of open-ended questions including how final-year students identify and refine their information needs, how they record and manage the retrieved information and how they process retrieved information to form their own arguments. Interview is selected as the most suitable qualitative method in this stage since it allows interviewees to provide wide range of opinions based on their experiences and behaviour (Leedy and Ormrod, 2001). Since the open-ended questions which this stage aims to answer follow the sequence of information seeking procedures (i.e. identify information needs, record retrieved information and then process information to form own arguments), the interview is structured rather than semi-structured or unstructured to ensure that interviewees will be asked for the same questions and in the same sequence to avoid confusion. Alternative qualitative method, such as observation, has not been adopted in this stage since it is too time-consuming and it is more difficult to ask undergraduates to participate in observations.

3.3 Designing the Survey

The structures of the questionnaire and the interview were designed after reviewing, analysing and comparing the survey methods of the previous research: Caravello et al (2001), Varga-Atkins et al (2004) and Cole and Kelsey (2004).

3.3.1 Questionnaire Design

The questionnaire contains four sections (as shown in Appendix 1). In order to make the term more general and easy to understand, information literacy skill is renamed as information seeking skill in both the questionnaire and the interview.

The first section of the questionnaire asks the recipients for their backgrounds and experiences on searching for information. The second section contains a set of statements to ask the recipients for their attitudes towards information seeking skills. The third section provides the recipients with a simple scenario, which assumes they are going to search for information about a company to apply for a job, and therefore asks them for the resources they will use to locate information and the standards they use to
evaluate retrieved information. There are two reasons for applying such a scenario in this section. First, since the resources used to locate information could be varied according to the nature of the task (such as doing an assignment or applying for a job), providing a scenario can help the researcher to judge whether the recipients can fully utilize various types of resources to complete a specific task. Secondly, considering the target recipients are final-year students and they should have the experiences for searching for company information to fill in job applications, therefore recipients will be able to provide realistic and valuable opinions on the given scenario regardless their departments. As shown by Varga-Atkins et al (2004), the best way to assess students’ information literacy skills is to ask them to perform specific tasks. Therefore the last section of the questionnaire contains two small tasks. The first task intends to find out whether recipients can really apply the evaluation standards they choose in section three to evaluate information for a specific topic especially in terms of content and currency. The second task strives to discover whether recipients can select the correct components which should be recorded in the bibliographic reference for a journal article.

The questionnaire was created using Dreamweaver and stored in the Internet (can be accessed at [http://www.yiume.bravehost.com/](http://www.yiume.bravehost.com/)). Technical terms, jargons and mistakes have been eliminated through the pilot test conducted before the questionnaire survey to ensure stakeholders can fully understand the questions. The pilot test was conducted within a few friends of the researcher (an example is giving in Appendix 2). A prize draw of £10 book token is offered to students who fill in the questionnaire. A covering letter (Appendix 3) is created to explain the aims of the questionnaire and the benefits respondents can receive by participating in the survey (i.e. have more facts they can mention to employers in job applications or recruitment assessments). Students can choose to receive a short analysis/result which evaluates their information literacy skills. They are therefore likely to provide more reliable data to the researcher in order to generate a more accurate analysis on their information literacy skills. Students who are willing to participate in the telephone interview will have the chance to win a PS2 game or a further £10 book token. The idea for providing such a prize here is that, since a PS2 game can be shared among a group of friends, if the respondents choose to win a PS2 game, they will receive a follow-up email which persuades them to invite their friends to participate in the survey to increase the possibility for winning the game. If they are not interested in the game they still have another choice to win a further £10 book token.
3.3.2 Telephone Interview Design

The structure interview has taken the form as telephone interview rather than face-to-face interview to make it more convenient and flexible to students. The interview (Appendix 4) provides another scenario, which assumes the interviewee is going to search for information for doing an assignment, and contains four questions regarding how interviewees identify and refine information needs and how they record and process retrieved information to form own arguments. The interview questions are kept as short and simple as possible to focus recipients’ attention and increase the response rate.

3.3.3 Target Population

This research focuses on final-year students in five departments of Sheffield University including Department of Computer Science, Department of Information Studies, Management School, Department of Automatic Control and Systems Engineering and Department of French. These five departments are selected purposely rather than randomly. It is considered that students from Information Studies Department should possess strong information literacy skills since they have received formal information literacy training in their first year and applied these skills throughout the course, Computer Science and Engineering students focus more on the technical skills and lack formal information literacy training, information literacy skills is extremely important for students in Management School since they intend to enter the business world, and students from a language department (i.e. French) will be another interesting group to investigate. Final-year students from these five departments intend to engage in different sectors and play various roles in the workplace and therefore provide more comprehensive and sharable perspectives for this research.

3.4 Conducting the Survey

3.4.1 Conducting Questionnaire Survey

The covering letter with the URL of the questionnaire has been sent to a total of 705 final-year students in the five departments by using the Central Email Service of the
An investigation into the information literacy skills developed by final-year students in the University of Sheffield university. However, there are initially only 49 students have filled in the questionnaire, which represents a 7% response rate, and only 6 students are from the Automatic Control and Systems Engineering Department and the French Department. In order to increase the response rate in the Engineering department and the French department, the questionnaire has been transformed from a web version to a paper version. Two lecturers from these two departments have been contacted to ask for permissions for handing out questionnaires to students by face to face in the tutorial. Consequently, further 23 students from these two departments have filled in the questionnaire and increase the total response rate to 10% (72 out of 705). Chart 3.1 shows the numbers of students that have filled in the questionnaire in the five departments.

<table>
<thead>
<tr>
<th>Number of students</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>65.3</td>
</tr>
<tr>
<td>Male</td>
<td>34.7</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3.1. Number and percentage of female and male respondents

In addition, female respondents (65.3%) account for a higher percentage than male respondents (34.7%).

3.4.2 Conducting Telephone Interview
At the end of the questionnaire, respondents were asked for their names and contact phone numbers if they were willing to participate in the telephone interview. A text message was then sent to the respondents to confirm the interview time which was suitable to them. Audio recorder had been used during the interview with the permission of the interviewee. Interviewee’s answers had been typed in the computer when the interview was ongoing. A total of 19 recipients were interviewed as shown in Chart 3.2.

The university’s Ethical Policy in research had been implemented in both questionnaire and interview survey to ensure the stakeholders’ dignity, rights, safety and well being was respected and safeguarded at all time.

3.5 Analysis of the Results

Once the questionnaire survey was completed, the software, named SPSS, was used to record and summarize questionnaire data to provide statistics, charts and tables for further discussion.

The interview answers recorded in the computer had been checked with records in the audio recorder after each interview and then reorganized and further compared once all interviews were completed.

The results/findings from questionnaire and interview will be presented, compared and discussed with reference to the relevant literature in Chapter Four and Five.

3.6 Constraints and Difficulties of the Research

Constraints of the research include:
- Since the research will mainly focus on five departments of the university due to the time limit, the results of the research cannot represent the views of final-year students in the whole university.
- The response rate of the questionnaire is only 10%, which means the results of the questionnaire cannot comprehensively represent the view of students in the five departments.
- There are averagely only 3 to 4 students from each department participated in the interview survey which means the results from interview survey cannot comprehensively represent the view of students in the whole department.
- The researcher has no prior experience for doing research and therefore increases the difficulties for conducting the research and affects the research progress.

Major difficulties encountered in the research include:

- Lots of mistakes and technical problems have been encountered when developing the questionnaire using Dreamweaver and therefore affect the research progress.
- The response rate is extremely low by using web questionnaire. In many cases, students (especially in engineering and French department) have received the covering letter of the questionnaire whereas they just ignored it. Handing in questionnaires to students by face to face in the tutorial will be a better choice for research which focuses on undergraduate students.
Chapter Four: Questionnaire Results and Discussions

This chapter presents and discusses the results of the questionnaire which collected a set of quantitative data from 72 students regarding their backgrounds and experiences on searching for information, their attitudes towards information literacy skills, the resources they use to collect information and the standards they adopt to evaluate retrieved information. In order to make the discussion clearer, five anonyms are given to the five departments as follows:

DACSE – Department of Automatic Control and Systems Engineering
DCS – Department of Computer Science
DF – Department of French
DIS – Department of Information Studies
MS – Management School

4.1. Students’ Backgrounds and Experiences on Searching for Information

4.1.1. How often students seek and use information to help them make better decisions when solving problems/tasks in their courses

The overall results above reveal that students are normally required to search and use information to solve problems and tasks in their courses regardless their departments.
Table 4.1.1 How often do students seek and use information

However, the results also reveal that students in the department of Computer Science and department of Information Studies likely have better information searching experiences than students in the department of Automatic Control and Systems Engineering and Management School since all DCS students and more than 80% of DIS students state they always need to seek and use information to solve tasks in their courses. Students from French Department might have less information searching experience in contrast with students in the other four departments since 80% of them state they sometimes seek and use information.

4.1.2. Whether students received any information skills training from their courses

![Chart 4.1.2. Have students received information skills training from their courses](chart)

35 (48.6%) students state they have received information skills training from their courses. This question can be made more specific since information skills training can take the forms as workshops, specific modules or library introductory sections. However due to the time limit and the length of the questionnaire, the author considers not to breakdown this question into more details.
4.2. Students’ Attitudes towards Information Literacy Skills

This section will only present and discuss students’ information literacy attitudes in an overall level and will not breakdown the discussion into each department since the differences occurred in the five departments are not obvious due to the size of the sample is not big enough.

4.2.1 Whether students feel searching for information is a waste of time and whether they consider information-seeking skills are useful

Students in all of the five departments manifest extremely positive attitudes towards information literacy skills since 63 (more than 84%) of them disagree or strongly disagree searching for information for solving a problem is a waste of time and 69 (more than 96%) of them agree or strongly agree information seeking skills are useful in everyday life. Although students in some departments, as discussed in section 4.1.1,
An investigation into the information literacy skills developed by final-year students in the University of Sheffield

have less experience on information searching, they still consider information literacy skills are important and useful. In addition, although as discussed in section 4.1.2, only 48.6% of students state they have received information skills training, this factor is not likely to affect students’ attitudes towards information seeking skills.

4.2.2. Whether students feel it is difficult for them to identify information needs

![Chart 4.2.2. Whether students feel it is difficult for them to identify information needs](image)

63 (more than 87%) students in the five departments state they rarely or sometimes feel it is difficult for them to identify the kind of information they need for a specific task. This result is similar to the finding provided by Varga-Atkins and Ashcroft (2004) who declare that students are capable for identifying suitable terms to describe their information needs. In addition, further discussion on this aspect will be given in Chapter Five to explain how students actually identify and refine their information needs.

4.2.3. Whether students feel it is difficult for them to find needed information from the Internet and from the library catalogue.

![Chart 4.2.3. Whether students feel it is difficult for them to find needed information from the Internet and library catalogue](image)
Major students in the five departments consider that they frequently or sometimes have difficulties for finding what they need from the Internet (55% of students) and from the library catalogue (75% of students). However, since the sample is not big enough and the difference is not so obvious, it is hard for the author to judge whether students feel it is more difficult for finding information from the Internet or from the library catalogue.

4.2.4. Format of information that students prefer

When students are asked whether they prefer electronic or print format for the information they found, 44 (61%) of them state they will prefer both electronic and print format. This attitude is important since if students prefer both electronic and print format they will be more flexible to explore and use various information resources.

4.2.5. Whether students feel it is difficult for them to evaluate which book/article suits their needs best
49 (68%) students in all five departments state they frequently or sometimes find it difficult to evaluate the suitability of the information they found whereas 21 (29%) of them say they rarely or never encounter difficulties for evaluating retrieved information. Further discussion of students’ ability on information evaluation is given in section 4.4.

4.2.6. Whether students feel it is difficult for them to synthesise and use retrieved information

Although 38 (57%) students state they frequently or sometimes have difficulties for synthesising and using retrieved information, 32 (44%) students state they rarely or never encounter difficulties for this issue. Further discussion will be given in Chapter Five to explain how students synthesise and using information to solve problems.

4.3. The Resources Students Use to Collect Information

In section three of the questionnaire (Appendix 1), students are given a scenario which assumes they are going to apply for a job and therefore need to search for information about the company that they are applying for. This section presents and discusses the resources students will use to locate suitable company information.

As shown in chart 4.4, the resource that most frequently used by students to search for company information is the company’s website which contains large amount of relevant information of the company. News, job fairs, company presentations and company guides (i.e. the Times top 100, etc) are also popular resources students will use to locate company information. These results reveal that students can use wide range of resources.
to locate and capture information, from resources provided directly by the company, to resources provided by media (i.e. news and magazines), to resources offered by academics (i.e. books contained company cases or history) and the career service. It is pleased to discover that students will also seek for opinions from external professionals (i.e. staffs from the career service or the company) which are important human resources and will always provide valuable suggestions.

4.4. The Standards Students Adopt to Evaluate Retrieved Information

4.4.1. Standards students use to evaluate retrieved information
Applying the same scenario mentioned in section 4.3, this sub-section presents and discusses the standards students will use to evaluate retrieved information. The results discover that students consider the purpose of the information, the contents that the information covers, the currency of the information and the intended audiences of the information, are important standards they will use to evaluate information. However, the quality and reliability of information can be significantly influenced by the information sources (such as the authors and the publishers) whereas the results reveal that not many students consider information sources as an important standard in their information evaluation process.

4.4.2. Information evaluation test

In order to examine whether students can actually apply the standards they identified above to effectively evaluate information especially in terms of information contents and currency, a simple test is designed. In the test, students are assumed that they are going to write a report with the topic “Sex discrimination at the contemporary workplace”, and they are therefore required to evaluate which of the three given articles suit their information needs best (Appendix 1, section 4). Indeed, only the first article, provided by Jacky Rander, can actually satisfy the students’ information needs in terms of content and currency. The second article, wrote by Bruce Martin in 1976, has the suitable content whereas is extremely out of date. The third article is up-to-date whereas has inappropriate content (focus on race discrimination rather than sex discrimination).

Unfortunately, the test result is disappointed since only 16 (22%) students answer the question correctly, 16 (22%) students give partly correct answers (selected both the correct answer and the wrong answer) and 40 (56%) students provide an entirely wrong
answer. A raised question is that: why students can select the appropriate information evaluation standards in sub-section 4.4.1 whereas they cannot correctly complete the test here? There are two possible answers. First, students might only select the information evaluation standards without carefully considering or fully understanding the given standards. Alternatively, students might recognise and understand the given standards whereas they are still not capable to apply these standards in their actual information evaluation process. One fact can be revealed from this test, as stated by Varga-Atkins and Ashcroft (2004) and Caravello et al (2001), is that undergraduates still lack skills to effectively evaluate information.

4.5. Bibliographic Reference Test

A second test is designed in the questionnaire (Appendix 1, section 4) to examine whether students can select a correct bibliographic reference for a journal article. Four options are given whereas only option three is correct and contains all necessary components to generate the reference for a journal article.

![Chart 4.5. Bibliographic reference test](image)

30 (42%) students eventually choose the correct option whereas 42 (58%) students provide a wrong answer. The result of this test proves the statement provided by Varga-Atkins and Ashcroft (2004) which state that some students are still lack of skills to correctly prepare a bibliographic reference.
Chapter Five: Interview Results and Discussions

This chapter presents and discusses the results of telephone interview survey which collected a set of qualitative data from 19 students who had filled in the questionnaire. The interview asked students for the methods they use to identify and refine information needs, record and manage retrieved information and process retrieved information to form their own arguments when doing assignments.

5.1. How students identify and refine information needs

Students from the Department of Automatic Control and Systems Engineering, Department of Information Studies and Management School show strong ability to identify and refine their information needs.

All DACSE, DIS and MS students state that they will read the criteria and requirements of the assignment to identify what topics are covered in the assignment and generate keywords to represent the main concepts of the topics.

A DACSE student stated that: "I will read the questions of the assignment, identify and understand the topics covered in the assignment and then use some keywords extracted from the topic to search for relevant information. …If I get everything I want with my original choice of keywords, I won’t change my choice. But if I can’t find the documents I want, I’ll refine the keywords and search again"

A DIS student stated that: “I will read some journals around the topic first to get a better understanding of the topic….then identify some keywords… I will revise the keywords when I get a better term to describe the topic during the information seeking process or after I discussed with the tutor”

1 DACSE – Department of Automatic Control and Systems Engineering; DCS – Department of Computer Science; DF – Department of French; DIS – Department of Information Studies; MS – Management School.
Nevertheless, students from Department of French and Department of Computer Science said they normally would not spend too much time on identifying and refining information needs.

A DCS student said: “I might guess it by myself or discuss it with my friends in the class…most of time I will not change my [information searching] direction.”

5.2. How students record and manage retrieved information

All interviewees are able to record and manage retrieved information in a highly structural and logical way.

Four DIS students said that, they would scan the article or read the abstract first to decide whether the document is useful and then create a new folder in the PC to store all useful documents or print them out.

Two DF students stated that, they prefer to print out all useful articles and then organise the articles by usefulness.

A DACSE student also said he will record the URLs of electronic documents in the PC or make a bibliography list for all suitable paper documents. He will breakdown the main topic of the assignment to several sub-topics and then allocate all electronic and paper documents into suitable sub-topics.

By reviewing the results of the Bibliographic Reference Test of these 19 interviewees, it is surprised that 15 of them actually did the test wrongly. It could be judged that even the students are not able to provide a correct bibliographic reference, they are still able to use various methods to help them effectively record and manage the retrieved information such as recording the URLs of web materials or printing the documents out directly. Nevertheless the main problem could be that if they are not capable of providing a correct reference, it will be difficult for the readers to follow their bibliography list to locate relevant documents.
5.3. How students synthesise retrieved information to form their own arguments

A majority of interviewees possess strong ability to synthesise and use retrieved information to form their own arguments. They normally use three or more steps summarised below to synthesise and compare useful information.

- Sort the articles by usefulness or topic areas;
- Read through all articles and then highlight the key points/concepts/arguments of all articles using different colour pens;
- Understand and compare the similar concepts and arguments of different articles;
- Quote some direct sentences from the articles and also make notes in their own words to describe specific concepts or ideas in the article;
- Use both the direct quotations and notes to form and support their own arguments.

It is pleased to see that students will organise/sort the retrieved information by usefulness or topic areas rather than by date or author which implies it is easier for them to compare and contrast the ideas in different articles. They all recognise simply copying and pasting other people’s work to their assignments is useless and they prefer to analyse and compare other people’s ideas and use those ideas as evidences to support their arguments. It can be revealed that students apply strong critical thinking skill in analysing and synthesising useful information.
Chapter Six: Conclusion, Recommendations and Further Research

6.1. Conclusion

The author successfully achieves all research aims and objectives and is now able to answer the research question set up at the beginning of this project.

Through the results presented and discussed in Chapter Four and Five, it can be conclude that final-year students from the five departments of Sheffield University have developed strong information literacy skills to capture and use information to solve problems. Final-year students have extremely positive attitudes towards information literacy skills and consider information literacy skills are important and useful in everyday life. They are capable of logically identifying and refining information needs and fully exploring and utilising various resources to locate and capture suitable information for specific tasks. They are particularly good at recording, organising, synthesising and applying retrieved information to form their own arguments. Nevertheless, information evaluation is still a weak point for many final-year students. Although students are able to identify and recognise the most important information evaluation standards, many of them still have difficulties for applying those standards to evaluate retrieved information. On the other hand, they are also weak at providing correct bibliographic references. Although this issue is not likely to significantly affect their abilities on recording and managing information, it is definitely a problem when they try to share the retrieved information with potential readers.

Most results of this study are similar with the findings provided by Caravello et al (2001), Varga-Atkins and Ashcroft (2004) and Kerins et al (2004) which have been discussed in the literature review. However, one major difference is that although many students stated they have not received or cannot remember whether they have received information skills training, this factor is not likely to affect final-year students’ attitudes towards information literacy skills and their confidence to search for information. The reason could be that, since all final-year students are required to search for and use information to solve problems or tasks in their courses, they have developed information literacy skills in a certain level by themselves and increased their
confidence on searching for information even they did not receive formal information literacy training. It can be seen that information literacy skills have been embedded as a part of many courses in the University of Sheffield.

6.2. Recommendation and Further Research

The university should provide more information literacy trainings to undergraduate students, especially to improve their information evaluation skills. The trainings can take the form as workshops or specific modules. It is suggested that the information literacy module rendered by the Department of Information Studies should be promoted to all departments in the university.

Further research can focus on assessing the information literacy skills developed by students in other departments or in other levels. A larger project can strive to investigate the differences between the information literacy skills required in the workplace and the information literacy skills students developed in the university and then examine whether and how students’ information literacy skills can actually help them to better solve problems in the workplace.

Word Count: 6613
Bibliography


An investigation into the information literacy skills developed by final-year students in the University of Sheffield


Mogg, R (2002) *An investigation into the information literacy skills needs of first-year undergraduates and into an appropriate method of assessing incoming students' information literacy abilities at Cardiff University*. MA, University of Sheffield.


Appendix 1: Questionnaire
Appendix 2: Pilot Test

------Original Letter------

Hi, Wendy:
I am looking for your help. Please fill in this questionnaire for me which is a part of my final dissertation. I would like you to provide me some feedback:

1) Did you experience any difficulties, uncertainties or ambiguities when filling the questionnaire?

2) Any improvements?

The questionnaire can be retrieved at the following URL:

http://yiume.bravehost.com

Thank you very much.

Alex

------Response------

Hi, Alex:
It is quite a nice site. Here are my suggestions:

1) For section 2, it is better for you to allow users to click on the answer rather than select from a roll-down list (which is a bit confuse)

2) For some questions, we can only choose “always happen”, “sometimes happen” or “never happen”, but in fact I only encounter that case for quite a few times. I think more options should be needed.

C u later

Wendy
Appendix 3 – Covering Letter

Dear Fellow Student:

I am a third year student in the Information Studies department and would like you to participate in a survey of information seeking skills which is a part of my dissertation.

As you recognize, information is surrounding all our lives. Your future employer is looking for candidates with strong skills to locate, evaluate and use information to make decisions and solve problems. This survey aims to investigate the level of information seeking skills developed by final year students in Sheffield University and contains two parts: a 5 minute questionnaire and a 10 minutes telephone interview. You are encouraged, but it is not mandatory, to engage in both parts.

The findings of the survey will provide you with a picture about how good your information seeking skills are when comparing with other students. It therefore will provide you with more facts that you can mention to your employer in a job application or recruitment assessment.

Since the survey focuses on final-year students, your help will be highly appreciated. As return, I am offering a prize draw of £10 book token for students who fill in the questionnaire. Students who are willing to participate in the telephone Interview will have the chance to win a PS2 game (Burnout 3: Takedown) or a further £10 book token.

Please follow the URL below to access to the questionnaire: http://www.yiume.bravehost.com/

Please note: The survey follows the guidelines in the 1998 Data protection Act from the University of Sheffield. All data you provided will be treated with confidentiality and you can request a copy of the findings.

For any questions, please do not hesitate to contact me (lia02gcp@shef.ac.uk).

Thank you in advance for your time and assistance

Kind regards,
Alex Peng
Appendix 4 - Structure Interview Questions

Have you got any assignments this semester? (Yes.) So when you are going to search for information for doing this assignment:

1. How can you identify what kinds of information you need? (I.e. discuss it with tutor or other students; identify some keywords around the topic of the assignment, etc.)

2. Assume you have now identified your information needs, will you revise and refine your information needs when the information searching process goes further? And how?

3. Assume you have found some information, what will you do with it in order to access it again in the future? How can you record and manage the information you found? (I.e. create a reading list to record the bibliographic references of all articles; store all articles in a specific folder in the PC or print out all articles and put them in a folder, etc.) How will you organize the references/articles (by topic, author, etc)?

4. Finally, how can you process this information to form your own argument? (I.e. record and summarize the main ideas of different articles, combine and compare the main ideas and then present it in your own words.)