

Information Literacy Skills of Students from a UK Business School

Emel Aktas¹ and Sepideh Kaffash²

¹Cranfield University,
School of Management
United Kingdom

²University of Massachusetts Boston,
Department of Accounting and Finance,
Boston, United States

Abstract

Information literacy is the ability to recognize there is a need for information and then taking the necessary actions to identify, locate, evaluate, and use the information accordingly. This article reports on a study analyzing the information literacy skills of business school students. Data were collected from student of a Business School in London using a questionnaire survey. Results indicate that students have lower confidence in performing some tasks related to identifying the need for information, planning the search strategy, gathering information, using data management tools and developing a personal profile as part of presenting their synthesis of information found, accessed and used for specific purpose. There are also differences between Level 1, Level 2 and Level 3 students in terms of their confidence in performing the specified task under a particular information literacy skill. The results of this research are beneficial in designing information literacy skill development activities in the future.

Keywords: Information literacy, higher education, business school students

Introduction

Nowadays, as easy access to information is increasing rapidly simultaneously technology solutions are showing up as well. The business environment is burdened by information overload (Bawden and Robinson, 2009; Dean and Webb, 2011). Business professionals use information as an input to their decision-making process, so students in business disciplines are expected to be information-literate and to use information effectively. Many information professionals at business schools have been investigating ways to effectively communicate information literacy skills (Fiegen, 2011). To put information literacy in context, we first provide its definition according to the Society of College, National and University Libraries (2011):

Information literate people will demonstrate an awareness of how they gather, use, manage, synthesize and create information and data in an ethical manner and will have the information skills to do so effectively.

A number of information literacy competency standards have gained broad acceptance in providing guidance on teaching these skills (Eisenberg, Lowe & Spitzer, 2004). Among these standards, those developed by the Association of College and Research Libraries (2000), the Australian and New Zealand Institute for Information Literacy (Bundy, 2004) and the Society of College, National and University Libraries (SCONUL) are the most widely accepted. The key skills suggested by these standards are presented in the literature review.

Rationale of the Study

In information-driven world one needs to be information competent in a complex. The significance of developing an information literate population is widely recognized (Bruce, 2004; Catts & Lau, 2008). Information literacy is a broader term, which encompasses not only skills but also attitudes to and motivation for learning (Herring, 2004). Educator at all level (primary, secondary, tertiary and professional education) needs to focus on developing information literate graduates. In this respect, the research on information literacy skills of the students is highly relevant to enhancing student experience by focusing on students' current level of information literacy skills and how they can be improved.

Research Questions

This study sought to answer the following research questions by analyzing the data collected:

1. What do students know about finding, accessing and using information?
2. Are there any differences between students at different levels in terms of finding, accessing and using information?

To answer these research questions, this research aimed at systematically exploring the information literacy skills of the students from a Business School with 10,000 undergraduates students in terms of finding, accessing and using the information they need for their studies.

The paper is structured as follows: Following section is literature review on information literacy. Section Method summarizes the methodology employed in the research. Findings are presented and discussed in result section. Finally, in discussion section finding are discussed and suggestions for future research been presented.

Literature Review

Information literacy was first used as a term by Zurkowski (1974) where Zurkowski considered a national goal of achieving information literacy for the private sector in the United States within following decade. Then, almost two decades later Doyle (1992) listed discrete attributes of an information literate person as someone who:

- Recognizes the need for information

- Recognizes that accurate and complete information is the basis for intelligent decision-making
- Accesses sources of information including computer-based and other technologies
- Evaluates information
- Organizes information for practical application
- Integrates new information into an existing body of knowledge
- Uses information in critical thinking and problem solving

Since the 1990s, much of the critical information literacy literature focused on issues related to the development and deployment of information literacy standards (Diekema et al., 2011). There are three key information literacy models developed by Association of College and Research Libraries (ACRL), Australian and New Zealand Institute for Information Literacy (ANZIIL) and SCONUL. The ACRL's approach to information literacy has been criticized for emphasizing location of information and omitting one stage of the information seeking process which is recognizing when information is needed (Johnston & Webber, 2003). On the other hand, the (Australian) ANZIIL provides a broader base for information literacy in comparison to the ACRL; however, the scope and the plan, which are identified by the SCONUL as key skills, are not touched upon in this broader approach to information literacy.

Lupton (2008) analyzed the drivers for emergence of information literacy as an educational outcome in universities in three categories: Student-centered inquiry-based pedagogies where the learning environment enables students to build knowledge by asking questions and framing problems for which effective use of information is required; explosion of information which necessitates integration of effective use of information into the curriculum; and Graduate attributes where information literacy is identified as a generic skill. Generic skills and graduate attributes are usually considered within the lifelong learning concept (Bundy, 2004) and they include written communication, information literacy, critical thinking, problem solving, as well as teamwork and presentation skills.

The suggestion of Bruce (1997) that students' experience of information literacy should be explored to strengthen any curriculum developed is still valid. Scholarly debate continues regarding the most effective ways to teach students how to use information (Maybee et al., 2013). Further research is required, starting from where the students see themselves in terms of their confidence in the seven information literacy skills proposed by SCONUL (2011, Table 1) so that we can better embed these skills into the curriculum across all levels.

In a recent study, Diekema et al. (2011) aimed to enable students to experience information literacy with a focus on information use in the construction of knowledge. They concluded that making decisions about authentic problems might focus the learner's attention in new ways, and help shift students' conception of information literacy from finding sources towards using information to learn. This is one of the key areas highlighted in the information literacy model of SCONUL (2011) where evaluating and presenting information is emphasized. Therefore, this research followed the comprehensive information literacy model of SCONUL (2011) in assessing the current status of Brunel Business School students.

Methodology

A quantitative research method has been applied in order to answer the research questions posed. With the purpose of addressing research questions one and two, 27 questions adopted from SCONUL (2011) were employed. These questions asked students to self-report their confidence in performing a variety of tasks related to the seven key information literacy skills identified in literature review section. Students' self-reporting of their performance in information literacy related specific tasks is frequently exercised by librarians as well (Neely,

2006).

Survey Design

The survey for business school students comprised of seven key information literacy skills; namely, Identify, Scope, Plan, Gather, Evaluate, Manage and Present. These skills were adopted from the core model of information literacy for higher education (SCONUL, 2011), which described the set of generic skills and understandings in relation to information literacy. In order to keep the survey at acceptable length, distinct tasks in each information literacy skill (number of questions under each skill) have been focused. Table 2 shows the number of questions under each skill.

We conducted a comprehensive literature review on information literacy skills and information literacy assessment. Informed by the previous studies in the literature, we designed and conducted a questionnaire survey to assess students’ information literacy skills. The survey was checked for face validity by three academics from Brunel Business School prior to the commencement of the survey. There are seven information literacy skills included in the survey and the reliability of these were tested by Cronbach’s a reliability measure (Table 1). We analyzed the data collected by means of the questionnaire to reveal the current situation of the students’ information literacy skills

Information literacy skill	Information Literacy SCONUL model	Number of questions	Cronbach’s
			<i>a</i>
Identify	Recognize a need for information	4	0.921
Scope	Distinguish ways in which the information gap may be addressed	3	0.91
Plan	Construct strategies for locating information	3	0.798
Gather	Locate and access information	4	0.908
Evaluate	Compare and evaluate information obtained from different sources	4	0.831
Manage	Organize, apply and communicate information to others in ways appropriate to the situation	3	0.933
Present	Synthesize and build upon existing information, contributing to the creation of new knowledge	6	

Table 1 Survey Structure and the Reliability Analysis

A total of 27 questions were asked under the seven key information literacy skills suggested by the SCONUL (2011). The students assessed their confidence in performing the tasks related to each information literacy skill on a 5-point Likert scales where 1 = Not at all confident, 2 = Slightly confident, 3 = somewhat confident, 4 = Very confident, 5 = Extremely confident. Initially. The current level of the students in terms of the tasks under seven information literacy skills has been presented in Table 2 and then in each subsection it has been investigated whether there are any differences between different levels.

Individual questions asked under each skill in Table 1 are given in Appendix A. Information Literacy Survey Questions. The students were asked to assess their confidence in performing specific tasks related to information literacy on a 5-point Likert scale.

Findings

Questionnaire Survey with Students

The sample consisted of 28 business school students from all three undergrad UK-based education system levels (12 participant in level 1, and 8 participants in the other two levels). Descriptive statistics of data has been presented in Appendix B.

It is evident in Table of Descriptive Statistics that there is deviation from normality in terms of skewness and kurtosis (should be zero for normally distributed data) in some but not all groups. Moreover, it is not possible to apply parametric methods (one-way ANOVA) to analyze differences in different levels since this data is in ordinal scale. The Kruskal-Wallis test is the nonparametric test equivalent to the one-way ANOVA, and an extension of the Mann-Whitney U test, which allows comparison of more than two independent groups where the data is collected in ordinal scale (Cohen et al., 2011) as is the case in this research. That is why, Kruskal-Wallis test is used for the analysis of students' confidence in their information literacy skills at different levels. Where significant differences were found between different levels of students, multiple comparisons were carried out using the Mann-Whitney U test. Throughout the analyses, the traditional significance level of $\alpha = 0.05$ is used in the tests. In order to save space, only tables for first task has been presented here and the tables for the other six tasks could be find in Appendix (C).

Identify

The tasks involved in Identify comprised of articulating current knowledge on a topic (IDENTIFY1), identifying a lack of knowledge in a subject area (IDENTIFY2), defining limits to the information need (IDENTIFY3) and identifying a search topic using simple terminology (IDENTIFY4). Comparison of all three levels in terms of tasks under Identify is given in Table 3.

LEVEL	N	IDENTIFY1	IDENTIFY2	IDENTIFY3	IDENTIFY4
1	12	14.042	13.792	10.708	11.667
2	8	14.875	12.313	15.813	12.875
3	8	14.813	17.75	18.875	20.375
Total	28				
χ^2		0.074	2.069	5.566	6.195
<i>p</i> -value		0.964	0.355	0.062	0.045*

* $p < 0.05$ Table3 Kruskal-Wallis Test: Mean Ranks of Levels for Identify

Only for the fourth task in Identify, which is identifying a search topic using simple terminology (IDENTIFY4), there is a statistically significant difference between the different levels ($\chi^2 = 6.195$, $p = 0.045$), with a mean rank of 11.67 for Level 1, 12.88 for Level 2 and 20.38 for Level 3. If the null hypothesis of no difference between levels is rejected, as is the case for IDENTIFY4 then it is possible to identify which pairs of treatments differ by running a Mann-Whitney U test between each pair. The test results are given in Table 4.

Comparison	Test statistic	<i>p</i> -value
Level 1 with Level 2	42.5	0.659
Level 1 with Level 3	19.5	0.022*
Level 2 with Level 3	13.5	0.045*

* $p < 0.05$ Table 4 Mann-Whitney U Test IDENTIFY4

The results in Table 4 suggest that there is a statistically significant difference between Level 1 and Level 3 and Level 2 and Level 3 in terms of identifying a search topic using simple terminology. There is no difference between Level 1 and Level 2 in terms of the confidence

in this task.

Scope

The tasks involved in Scope comprised of identifying which types of information will best meet the need (SCOPE1), identifying available search tools (SCOPE2), identifying different formats in which information may be provided (SCOPE3). Results suggest that there is there is a statistically significant difference between the different levels for SCOPE1. Results of Mann-Whitney U test shows there are statistically significant differences between Level 1 and Level 3 and Level 2 and Level 3 students in terms of how confident they feel in identifying which types of information will best meet the need (SCOPE1). There is no difference between Level 1 and Level 2 in terms of the confidence in this task.

Plan

The tasks involved in Plan comprised of setting a search question clearly (PLAN1), defining a search strategy with appropriate keywords (PLAN2) and selecting the most appropriate search tools and techniques (PLAN3). No statistically significant differences between Level 1, Level 2 and Level 3 in terms of the confidence in performing the tasks under Plan has been found. Therefore there is no need for further analysis (i.e. comparisons using Mann-Whitney U Test).

Gather

Gather comprises of four tasks; constructing complex searches appropriate to different resources (GATHER1), accessing online information and data (GATHER2), keeping up to date with new information (GATHER3) and engaging with the community to share information (GATHER4). Not enough evidence been found to conclude there are differences in different levels in terms of their confidence in performing the tasks under Gather. Although the students' confidence in performing the tasks numbered GATHER1 and GATHER4 ranges between slightly confident and somewhat confident whereas their confidence in performing the tasks numbered GATHER2 and GATHER3 ranges between somewhat confident and very confident, there is no difference between Level 1, Level 2 and Level 3 in terms of their confidence in performing each task under Gather.

Evaluate

The tasks involved in Evaluate comprised of choosing suitable material on the search topic (EVALUATE1), assessing the accuracy, bias and credibility of the information resources (EVALUATE2), reading critically, identifying key points and arguments (EVALUATE3) and identifying when the information need has not been met (EVALUATE4). The results suggest there are statistically significant differences among levels in terms of EVALUATE3, The Mann-Whitney U test results show that there are significant differences between Level 1 and Level 3, and Level 2 and Level 3 as was the case for IDENTIFY4 and SCOPE1. There are no significant differences between Level 1 and Level 2 students in terms of their confidence in performing the tasks numbered EVALUATE3 and EVALUATE4.

Manage

Manage tasks comprised of using appropriate data management software and techniques to manage data (MANAGE1), demonstrating awareness of issues relating to data protection, copyright and plagiarism (MANAGE2) and meeting the standards of conduct for academic integrity (MANAGE3). No statistically significant differences between Level 1, Level 2 and Level 3 students in terms of their confidence in performing the tasks under Manage has been found.

Present.

The tasks involved in Present comprised of using information and data found to address the original question (PRESENT1), summarizing documents and reports (PRESENT2), incorporating new information into the context of existing knowledge (PRESENT3), synthesizing and appraising information from different sources (PRESENT4), analyzing and presenting data appropriately (PRESENT5) and developing a personal profile in the community using appropriate networks (PRESENT6). The results suggest there are statistically significant differences among levels in terms of the tasks numbered PRESENT4. A Mann-Whitney U test is conducted to identify the differences between each pair of levels. A significant difference between Level 1 and Level 3 and Level 2 and Level 3 in PRESENT4 and PRESENT5 is reported. However, for PRESENT6, there is a significant difference only between Level 1 and Level 3 but no evidence of difference between Level 2 and Level 3. It is related to developing a personal profile where it might be of assistance to the students in introducing the importance of this task in terms of developing information literacy skills. On the other hand, there are no significant differences between Level 1 and Level 2 students in terms of their confidence in performing the tasks numbered PRESENT4, PRESENT5 and PRESENT6.

Discussion

This research set out to investigate the current status of the students in terms of the tasks considered as part of information literacy skills owing to its first research question. It was found that the students had lower confidence compare to each other. These tasks were related to articulating current knowledge on a topic, defining limits to the information need, defining a search strategy, selecting the most appropriate search tools, constructing complex searches appropriate to different resources, engaging with the community, using data management software and developing a personal profile in the community. Therefore, these tasks could be given specific attention during library sessions as well as in lectures and seminars. In overall, the results could be taken into consideration in the process of designing information literacy skill development activities targeted at different levels since different levels have varying needs.

The second research question was inquiring about the differences between confidences of students at different levels in performing the specified tasks. There was no difference in terms of the 10 tasks under Plan, Gather and Manage. On the other hand, differences were between different levels in identifying a search topic using simple terminology, identifying which types of information will best meet the need, reading critically, identifying key points and arguments, identifying when the information need has not been met, synthesizing and appraising information from different sources, analyzing and presenting data appropriately and developing a personal profile in the community using appropriate networks. Where differences were found, they were usually between Level 1 and Level 3 and between Level 2 and Level 3 students. In majority of the tasks, there were no differences between Level 1 and Level 2. For example, for Identify task as results of Table (3) shows there is no difference between Level 1 and Level 2 in terms of the confidence in this task. This result could be due to the fact that the students do search for information intensively in the third year as part of their final year project. For Scope task, this could be beneficial in designing activities for sharpening information literacy skills of our students particularly where they would be required to identify which types of information will best meet the need.

This finding is in line with the findings of Callinan (2005) where information literacy competence improved as the students progressed in their program.

Arts et al. (2006) explored stages in managerial problem-solving skills of participants beginning with formal education and continuing through the professional workplace setting.

They found that progress in expertise in terms of information literacy is not so straightforward or linear as often assumed. Current study presents the importance and relevance the information literacy skills research among Business School students, which will enter professional workplace in future. So there is a possibility of relapse in information literacy skills gained during the university education in a few years following the commencement of professional life. In that respect, the university can take action proactively and offer challenges sharpening these skills for their graduates as part of life-long learning activities. A good example of these activities is short-term courses and seminars organized by universities. Many business schools would have a short session on information literacy refresher at the beginning of the program, in particular at graduate level.

In the light of the extant literature and the findings of this research it is concluded that learning and teaching methods should engage students in more advanced information literacy. Neely (2006) reported that exposure, experience, attitude and students' relationships with their instructors were major factors affecting information literacy outcomes. That is why information literacy should be tightly embedded in the curricula of business programs as well as programs of other disciplines.

Limitations and Suggestions for Future Studies

It should be recognized that this is a small-scale research and one should be cautious in generalizing its results. However, the research and its results are useful for setting the background for a larger scale study involving hundreds of students from multiple schools across different universities.

Another point to note is that this research employed a self-assessment questionnaire, where the students were asked their confidence in completing the tasks associated with the seven information literacy skills. A recommendation for future research would be to combine this research design with librarians' information literacy assessment tools to reveal whether what students believe they know is translated into practice. For example, multiple choices questionnaire, analysis of bibliographies, quiz/test, portfolio, essay, observation, simulation and final grades (Walsh, 2009) could be considered in addition to or as complementary to the self-assessment.

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Appendix A: Information Literacy Survey Questions

The responses are collected on a 5-point Likert scale where 1 = Not at all confident, 2 = Slightly confident, 3 = Somewhat confident, 4 = Very confident, 5 = Extremely confident

IDENTIFY: How confident are you in performing the following tasks related to identifying a personal need for information?

- 1 - Articulating current knowledge on a topic
- 2 - Identifying a lack of knowledge in a subject area
- 3 - Defining limits to the information need
- 4 - Identifying a search topic using simple terminology

SCOPE: How confident are you in performing the following tasks related to assessing current knowledge and identifying gaps?

- 1 - Identifying which types of information will best meet the need
- 2 - Identifying available search tools
- 3 - Identifying different formats in which information may be provided

PLAN: How confident are you in performing the following tasks related to constructing strategies for locating information and data?

- 1 - Setting a search question clearly
- 2 - Defining a search strategy with appropriate keywords
- 3 - Selecting the most appropriate search tools and techniques

GATHER: How confident are you in performing the following tasks related to locating and accessing information and data?

- 1 - Constructing complex searches appropriate to different resources
- 2 - Accessing online information and data
- 3 - Keeping up to date with new information
- 4 - Engaging with the community to share information

EVALUATE: How confident are you in performing the following tasks related to comparing and evaluating information and data?

- 1 - Choosing suitable material on the search topic
- 2 - Assessing the accuracy, bias and credibility of the information resources
- 3 - Reading critically, identifying key points and arguments
- 4 - Identifying when the information need has not been met

MANAGE: How confident are you in performing the following tasks related to organising information professionally and ethically?

- 1 - Using appropriate data management software and techniques to manage data
- 2 - Demonstrating awareness of issues relating to data protection, copyright and plagiarism
- 3 - Meeting the standards of conduct for academic integrity

PRESENT: How confident are you in performing the following tasks related to applying the knowledge gained?

- 1 - Using information and data found to address the original question
- 2 - Summarizing documents and reports
- 3 - Incorporating new information into the context of existing knowledge
- 4 - Synthesizing and appraising information from different sources
- 5 - Analyzing and presenting data appropriately
- 6 - Developing a personal profile in the community using appropriate networks

Appendix B: Descriptive Statistics

Measure	Minimum	Maximum	Mean	Variance	Skewness	Kurtosis
IDENTIFY1	2	4	2.96	0.702	0.07	-1.582
IDENTIFY2	2	5	3.18	1.041	0.292	-1.058
IDENTIFY3	1	4	2.71	0.878	0.047	-1.006
IDENTIFY4	1	5	3.36	1.497	-0.1	-1.236
SCOPE1	1	5	3.14	1.46	-0.022	-1.027
SCOPE2	1	5	3.29	1.471	0.074	-1.171
SCOPE3	1	5	3.25	1.528	-0.135	-1.03
PLAN1	1	5	3.04	1.739	0.034	-1.004
PLAN2	1	5	2.96	1.739	0.279	-1.148
PLAN3	1	5	2.93	1.18	0.151	-0.692
GATHER1	1	5	2.82	1.708	-0.074	-1.283
GATHER2	2	5	3.61	0.692	-0.782	0.048
GATHER3	1	5	3.14	1.238	-0.475	-0.368
GATHER4	1	5	2.89	1.136	-0.168	-0.688
EVALUATE1	1	5	3.14	0.868	-0.006	0.15
EVALUATE2	1	5	3.04	1.147	0.314	-0.642
EVALUATE3	1	5	3.25	1.528	-0.008	-0.911
EVALUATE4	1	5	3.21	1.36	-0.45	-0.483
MANAGE1	1	5	2.75	1.38	0.083	-0.635
MANAGE2	1	5	3.14	1.238	0.046	-0.317
MANAGE3	1	5	3.25	1.306	-0.05	-1.042
PRESENT1	2	5	3.43	0.995	-0.03	-0.993
PRESENT2	2	5	3.64	0.831	0.174	-0.877
PRESENT3	2	5	3.39	1.136	0.104	-1.179
PRESENT4	1	5	3.29	1.323	-0.138	-1.082
PRESENT5	1	5	3.36	1.423	-0.058	-1.089
PRESENT6	1	5	2.96	1.665	0.071	-1.009