Conceptions of information literacy: new perspectives and implications
Sheila Webber and Bill Johnston
Journal of Information Science 2000; 26; 381
DOI: 10.1177/016555150002600602

The online version of this article can be found at:
http://jis.sagepub.com/cgi/content/abstract/26/6/381

Published by:
SAGE
http://www.sagepublications.com

On behalf of:
cilip
Chartered Institute of Library and Information Professionals

Additional services and information for Journal of Information Science can be found at:

Email Alerts: http://jis.sagepub.com/cgi/alerts

Subscriptions: http://jis.sagepub.com/subscriptions

Reprints: http://www.sagepub.com/journalsReprints.nav

Permissions: http://www.sagepub.co.uk/journalsPermissions.nav

Citations http://jis.sagepub.com/cgi/content/refs/26/6/381
Conceptions of information literacy: new perspectives and implications

Sheila Webber
University of Sheffield, UK

Bill Johnston
University of Strathclyde, Glasgow, Scotland, UK

Received 28 July 2000
Revised 13 August 2000

Abstract.
The authors identify some key definitions of ‘information literacy’ and initiatives concerned with imparting information literacy skills. They identify limitations in taking an approach to information literacy which assumes that it can be boiled down to a list of skills. Alternative conceptions of information literacy are described. Previous research has identified a lack of information on how students experience and define information literacy. The authors describe the student response to a one-semester credit-bearing class in information literacy, taken by business students at the University of Strathclyde, and relate it to two models of information literacy. They go on to discuss two issues in the light of previous developments and their own research: appropriate pedagogic methods for educating for information literacy and information literacy as a discipline in its own right. They conclude by identifying further areas for research and by recommending that information scientists should lead the way in defining this growing area.

1. Introduction

Information literacy has received increasing academic attention since the mid-1970s, particularly in the USA and Australia, as a theoretical and practical response to the cultural, social and economic developments associated with the information society.

As will be described later in this paper, there is ample literature defining the term ‘information literacy’ and providing case studies. However, Bruce [1] has noted the lack of research into the student view of information literacy, identifying it as a ‘significant gap’. She goes on to state that: ‘Students’ experience of information literacy will need to be explored, through further research, to strengthen any curriculum developed and to help in the diagnosis of learning difficulties’ [1, p. 157].

As a contribution to this area, the authors took an action research approach to design, implementation and monitoring of an information literacy class for business school undergraduates, with a focus on analysis of the students’ response. In the process of designing and running the class, the authors’ conception of information literacy has developed. It has been found useful to compare not only the authors’, and their students’, conception of information literacy with that of other researchers, but also to compare the fields of information literacy and information science. Discussion arising from these comparisons is presented here.

The differences in conception of information literacy also lead to different pedagogic approaches and this area is also addressed in the paper, since the authors would contend that some common (mis?)conceptions of information literacy have led to an inappropriate pedagogic strategy.

This paper starts with a brief summary of key initiatives concerning information literacy, comparing the different approaches to its definition.

Correspondence to: S. Webber, Department of Information Studies, University of Sheffield, Western Bank, Sheffield S10 2TN, UK. Tel: +44 114 222 2641. E-mail s.webber@sheffield.ac.uk
2. Approaches to, and definition of, information literacy

2.1. The emergence and growth of information literacy

Paul Zurkowski has been credited with coining the term ‘information literacy’, in his proposal to the US National Commission on Libraries and Information Science in the early 1970s [2]. Zurkowski made a critical leap from the province of information specialists by advocating that the US Government should establish a national programme aimed at achieving widespread, work-related, information literacy. He recognised that ‘information literates’ would be better able to exploit information resources. (As President of the Information Industry Association, he would also have had an interest in increasing the market for his members’ electronic information products.)

Spitzer, Eisenberg and Lowe [3] have identified the subsequent milestones in the development of information literacy in the USA. They note the linkage of information literacy to democratic ideals during the 1970s and chart the acceleration of interest in the 1980s in response to the recognition that computers and networks were set to revolutionise the field of information management and communication. This impetus led to the establishment of the National Forum on Information Literacy (NFIL) in 1989 [4] and the Institute for Information Literacy (IIL, formerly the National Information Literacy Institute) in 1998 [5]. The IIL has as its aims to prepare and support librarians and other educators in US higher education in the development and teaching of information literacy programmes. NFIL members are organisations which represent a broader community and NFIL has a correspondingly wider remit.

The 1989 Final Report of the American Library Association’s Presidential Committee on Information Literacy [6] was significant, in that it recognised the importance of the term and also sought to define the skills of information literacy. This definition is quoted by numerous other commentators: ‘To be information literate, a person must be able to recognise when information is needed and have the ability to locate, evaluate, and use effectively the needed information’ [6, p. 1].

The domain is therefore familiar from the discipline of information science. A key difference, though, is in the emphasis on the ability of one individual (the information literate person) to carry out these activities. This contrasts with the information scientist’s role in developing theory, applying it to a multiplicity of different users in differing situations and creating new theories and information systems.

A distinctive feature of definitions of information literacy is the tendency to personify it as a set of personal attributes. For example, Doyle [7] has defined an information literate person as one who:

1. recognises the need for information;
2. recognises that accurate and complete information is the basis for intelligent decision-making;
3. identifies potential sources of information;
4. develops successful search strategies;
5. accesses sources of information, including computer-based and other technologies;
6. evaluates information;
7. organises information for practical application;
8. integrates new information into an existing body of knowledge; and
9. uses information in critical thinking and problem solving.

Lenox and Walker [8] have also defined information literacy, by characterising the information literate person: one who has the analytical and critical skills to formulate research questions and evaluate results and the skills to search for and access a variety of information types in order to meet his or her information need. Most definitions, in fact, circle around these stages of need recognition, search formulation, source selection and interrogation, information evaluation and information synthesis and use.

While there has been increasingly widespread use of the term ‘information literacy’, some commentators have proposed new words or phrases which they perceive as expressing a broader concept. For example, Goetsch and Kaufman [9] have rejected information literacy in favour of ‘information competency’, while Carbo [2] has proposed the term ‘mediacy’. The alternatives generally seem to be proposed either in order to emphasise the fact that a person should be literate in all media, including electronic media, or because of discomfort with the word ‘literacy’ (possibly anticipating that those being taught would be unwilling to see themselves as illiterate). There is an extensive literature that discusses the term and its definition and readers who wish to explore this topic in more depth are referred to Spitzer, Eisenberg and Lowe’s work [3] and Smith’s [10] information literacy portal.

The Association of College and Research Libraries (ACRL) Information Literacy Competency Standards for Higher Education [11] synthesise and develop preceding work by defining key areas of desirable behaviour, i.e. the information literate student:

1. determines the nature and extent of the information needed;
(2) accesses needed information effectively and efficiently;
(3) evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system;
(4) individually or as a member of a group, uses information effectively to accomplish a specific purpose;
(5) understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.

For each of these areas, performance indicators and indicative outcomes are listed. For example, the measurable outcomes for determining whether the student is able to determine ‘whether the new knowledge has an impact on the individual’s value system and take steps to reconcile differences’ are that the student: ‘Investigates differing viewpoints encountered in the literature’ and ‘Determines whether to incorporate or reject viewpoints encountered’.

Bruce [1] has outlined the development of information literacy in Europe and Australia. She notes projects such as those described by Fjällbrant (whose involvement in the Distance EDucation Information Courses with Access Through nEtworks (DEDICATE) project is described by Fjällbrant and Levy [12]). A significant influence on the Australian perspective has been the report Developing Lifelong Learners Through Undergraduate Education [13], in which information...
literacy is identified as a vital element of the undergraduate curriculum. The work of Bruce (based in Australia) is described further in section 2.3 below.

Developments in the UK have tended to lag behind those in Australia and the USA. The Standing Conference of National and University Libraries (SCONUL) drew up a framework for the ‘seven pillars’ of information literacy in 1999 [14]. These seven areas provide a progression from the most basic skill (‘Ability to recognise a need for information’) to the most sophisticated (‘Ability to synthesise and build upon existing information, contributing to the creation of new knowledge’): see Fig. 1. The authors of the report envisage undergraduates engaging with the bottom pillars, while postgraduates and researchers would be aspiring to the seventh level. It can be seen that this staged approach is compatible with Doyle’s definition [7] and encompasses topics in the ACRL standards [11].

The importance of information literacy has been acknowledged explicitly or implicitly in reports from UK Government-funded bodies. In its strategic statement, 2020 Vision [15], the Library and Information Commission (now the Council for Museums, Archives and Libraries) has highlighted the importance of access to knowledge. Although the phrase ‘information literacy’ is not actually used in the document, it does state that: ‘Individuals will need a range of literacies to enable them to maximise their potential, individually and collectively’. The National Grid for Learning [16], an initiative launched by the UK Government in 1998, promotes some of the skills and knowledge encompassed by information literacy. However, the stress is on information and communication technologies (ICT), with some implication that skills such as Internet searching are ICT skills rather than higher-level problem-solving skills.

Both the SCONUL and ACRL initiatives are drawing, implicitly or explicitly, on the many years’ experience that librarians have in ‘user education’: teaching users to identify and search information resources, etc. This provides an important base point for further development, but the challenges associated with a ‘library skills’ approach to information literacy are highlighted below.

2.2. Limitations of the ‘list’ approach to information literacy

A focus on desirable user behaviour and outcomes is understandable, particularly when the largest amount of, and (in practical terms) most influential, work has been done for, or by, library and information practitioners. However, while this approach seems to put the individual at the centre of the process, in fact the result has been increasing numbers of ever more detailed lists. There is a danger that a strategy like that of ACRL results in a ‘tick the box’ approach: reducing a complex set of skills and knowledge to small, discrete units. The assumption seems to be that the skills have been mastered for good once each unit can be labelled as completed. This fragments the field of knowledge and reflects a ‘surface learning’ approach (with a short-term focus on the task in hand) rather than a ‘deep learning’ one (in which the students are encouraged to reflect on and contextualise what they are learning, in a manner that enables them to use the knowledge or skill outside the task in hand: see, for example, [17, p. 46]).

It is worth mentioning the ‘key skills’ agenda here, because it is a recurrent theme in initiatives for UK further and higher education. These are transferable (‘key’) skills which students will need both for their studies and for the world of work. Drew [18] has provided a useful summary of the many initiatives and debates concerned with key skills. The skills identified in the Dearing Report (communication, numeracy, the use of information technology and learning how to learn) [19] can be seen as continuing this agenda.

In this context, Whitson [20] has criticised the ‘tick box’ approach to key skills which ‘almost inevitably generates “competence” statements which are meaningless, trivial or both’ [20, p. 311]. He stresses that the emphasis should, rather, be on educational processes.

A further problem for information literacy education is that, 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. Librarians who are teaching information literacy identify the problem of being allowed very limited time in which to educate students in this complex field. This may amount to only a one- or two-hour session shoehorned into a class timetable. For example, Brancolini and Heyns [21] have described an enthusiastic and entrepreneurial strategy mapped out by the library and information professionals for furthering their information literacy programme. However, in this case study (of Indiana University Health, Physical Education and Recreation), the authors note both the school’s refusal to add a credit-bearing class and the inadequacy of one-off sessions incorporated into other classes. Farmer [22] has identified some of the barriers to implementation of information literacy programmes.
The result may be a learning and teaching strategy which fails to engage the student at anything but the most superficial level. The student may gain a few tactics which enable him or her to negotiate some specific information sources. However, the student does not become information literate, capable of engaging in a fast-changing information society. Bruce noted that ‘the information literate person is one who experiences information literacy in a range of ways, and is able to determine the nature of experience it is necessary to draw upon in new situations’ [1, p. 169]. Fig. 2 illustrates the view of the authors of this paper with regard to ways in which one individual will experience changes that affect the type of information they need and how they can access, evaluate and use it. Their needs will be influenced by external changes (e.g. in copyright laws or in technology) and by changes in their own lives (e.g. changing jobs, changes in their employer’s policies, changing personal circumstances, ageing). Information literacy will be useful for lifelong learning and it must be adaptable to changes through life.

2.3. Alternative approaches to information literacy

Bruce [1] has provided a perspective on the educational approach to information literacy. She describes three strategies:

1. **behaviourist approach**: ‘in this view, the information user, to be described as information literate, must exhibit certain characteristics and demonstrate certain abilities’, so there is emphasis on measurable skills. The approach used in the ACRL standards, mentioned in section 2.1 above, seems to fit here;

2. **constructivist approach**, with the emphasis on the learner constructing his or her own picture of the domain through, for example, problem-based learning;

3. **relational approach**: which starts by describing a phenomenon in terms of the way in which it is experienced.

Bruce favours the relational approach. While seeing merits in the constructivist approach, she feels that this leads to the weakness of still having to define the area with reference to characteristics exhibited by individuals. Using phenomenographic methods, Bruce [34] has identified seven different ways in which individuals experience information literacy, the ‘seven faces’ of information literacy, ranging from an ‘information technology conception’ to a ‘wisdom conception’ (see Table 1).

Interestingly, on the IIL website, Bruce’s work [1] is identified as a key text, with the comment that it ‘shows information literacy is far more fluid and complex than American standards and guidelines might suggest’ [23].
Limberg [24], who applied phenomenographic methods to a study of information seeking in Swedish students, developed a further point. She found that students who experienced information seeking and use as ‘fact finding’ also, for the most part, took what might be characterised as a surface-learning approach to an information-seeking assignment (e.g. they assembled fragments of information in a disconnected manner). On the other hand, those students who experienced information seeking as ‘scrutinising and analysing’ tackled the information assignment (a report on consequences of European Union membership) in a manner which implied deeper engagement with the subject matter, since they synthesised and compared material and contributed their own considered views.

Limberg draws on Bruce’s research and goes on to suggest that educators who experience information literacy as biased towards information technology (IT) or as linear fact-finding may be transmitting this approach to their students and that, in its turn, may be encouraging or reinforcing surface-learning approaches to academic assignments.

One might develop this further to hypothesise that by adopting teaching methods which encourage students to experience information literacy in more complex ways, educators would be influencing learning outcomes in other subject areas, insofar as these other subjects involve selection, evaluation and synthesis of information.

2.4. Information literacy and information science

Since one of the themes of this paper is that of defining information literacy, it is useful to consider the scope of a discipline with which it is intertwined: that of information science. Both the terms ‘information’ and ‘information science’ have been discussed and defined many times in the literature and only some themes which are felt to be particularly relevant to this paper are highlighted here. Saracevic [25] has provided an overview of the development of information science. He quotes White and McCain, who state that ‘the proper study of information science is the interface between people and literature . . . information scientists seek to understand communication between persons and certain valued surrogates for persons that literature comprises’ [25, p. 1056] There is therefore a focus on information content (rather than purely the technology used to transmit it) and the interaction between people (implicitly, within social, cultural and organisational contexts) and this information content. Additionally, Summers et al. [26] noted that information scientists have been characterised as not only organising and retrieving information for clients, but also evaluating that information (in contrast with librarians, who were seen to have a more passive role).

These authors and, for example, Ingwersen [27] have stressed the interdisciplinary nature of information science. Fig. 3 displays Ingwersen’s diagram, which shows the fields with which information science inter-

### Table 1

| Category one: The information technology conception. | Information literacy is seen as using information technology for information retrieval and communication. |
| Category two: The information sources conception. | Information literacy is seen as finding information located in information sources. |
| Category three: The information process conception. | Information literacy is seen as executing a process. |
| Category four: The information control conception. | Information literacy is seen as controlling information. |
| Category five: The knowledge construction conception. | Information literacy is seen as building up a personal knowledge base in a new area of interest. |
| Category six: The knowledge extension conception. | Information literacy is seen as working with knowledge and personal perspectives adopted in such a way that novel insights are gained. |
| Category seven: The wisdom conception. | Information literacy is seen as using information wisely for the benefit of others. |
acts. Since both the information-using person and the system which he or she uses are the foci of study, information science draws on theory from psychology, linguistics and sociology (to illuminate study of the user) and from computer science and engineering (to develop information tools). At the same time, the discipline has maintained its links with information practitioners who have been constructing new information products, managing access to information and reconceptualising organisations as information systems.

Although recognition of the importance of knowledge workers occurred some decades ago (notably in Machlup’s [28] classic study), information science has remained a small, specialist discipline. The emergence of a mass market for electronic information via the Internet has, however, placed in the foreground the knowledge and skills that have been seen as part of information systems.

Skills in information selection, organisation and handling are no longer confined to the information professionals, but have become the concern of almost everyone. Zuboff [29], for example, sees the information-rich workplace potentially delivering more equality and added value for the company: ‘Exploiting the informed [sic] environment means opening the information base of the organization to members at every level, assuring that each has the knowledge, skills and authority to engage with the information productively’ [29, p. 164]. The study on knowledge management by TFPL [30], carried out for the Library and Information Commission, stresses that all staff will need information literacy skills.

Taken together with changes in the nature of economic activity from industrial to knowledge-based wealth creation, these developments represent the conditions for developing a new, more socially widespread discipline to help people, in general, to manage the economic and technological realities of the information age. While it would be difficult to argue that every citizen needs to follow a course in information science, one can put forward a case for every citizen studying information literacy. As will be outlined below, it is felt that this study needs to go beyond the library instruction approach (insofar as the latter consists of the odd snatched hour of training).

The Institute of Information Scientists [31] has outlined its criteria for information science (used for course validation). It prefaces the detailed description of the core area (information science) with the definition: ‘The theory and practice of creating, acquiring, assessing and validating, organising, storing, transmitting, retrieving and disseminating information’. This core statement fits
well with the core features which most commentators, as outlined above, identify for information literacy. These skills are outlined in the report and it is highlighted how essential they are if companies are to achieve effective knowledge management.

3. Information literacy at the University of Strathclyde: course design and delivery

This section outlines the way in which an information literacy class was designed and implemented at the University of Strathclyde and describes the students’ response. It is included in order to present a student view of information literacy (which, as noted in the introduction, has been under-represented in the literature), which is compared in section 4.1 with some of the information literacy models outlined above.

The description of our class also provides background for the discussion in sections 4.2 and 4.3, since our views on information literacy have developed through two years of dialogue with students and this dialogue has provided as much food for thought as has our interaction with the literature and with colleagues.

3.1. Course design and investigation

We aimed for an action research approach to course design (described further in [32]). Action research in education is a methodological approach which has developed to meet concerns with ‘the apparent gap between research and theory on the one hand and daily practices of education on the other’ [33].

An action research approach allows the investigation of educational questions and professional experience by integrating practice, and analysis of practice, as a unified development. This method emphasises the collection and analysis of qualitative data as a distinct part of teaching practice. Action research involves participants in:

(1) a process of becoming aware of the assumptions that teachers and students make about learning and the effect of these assumptions on behaviour;

(2) understanding the relationships between the elements that make up various phenomena in the educational context;

(3) including everyone’s view as a contribution to understanding the situation;

(4) seeing theory and practice as two interdependent yet complementary phases of the teaching and learning process.

This approach allows differences in disciplinary contexts, e.g. information science/educational development, to be compared and contrasted, using participant observation and collection of qualitative and quantitative data for analysis and interpretation.

We aimed to foster an action research approach, in line with the principles above, by:

(1) teaching the class collaboratively, with the authors both being present at most sessions and comparing and recording views on the learning and teaching process;

(2) stimulating student views on class content, on learning and teaching methods and on their own development as information literate people, through a planned sequence of exercises. The emphasis during lecture, tutorial and laboratory meetings was on collaboration, brainstorming, discussion and reflection on the learning process. In this respect, we were adopting a number of the strategies identified by Marton and Ramsden and summarised by Bruce [34] as being part of a relational approach (e.g. helping students to recognise how they are conceiving information literacy; presenting the student with new ways of seeing);

(3) making a conscious attempt to implement and test theory, relating both to class content and to new methods of class delivery, to evaluate outcomes and to modify and test our strategy anew in iterations of the class.

The hypotheses we aimed to test via the information literacy class included the following:

(1) that, in order to engage students in the more ‘advanced’ information literacy skills (e.g. the seventh ‘pillar’ of the SCONUL model), we needed to use learning and teaching methods which encouraged reflection. The chosen methods had to enable students and lecturers to review and demonstrate progress over a period of time (exercising different aspects of information literacy in different contexts, this being an essential element of information literacy, as highlighted above). This approach involves rejecting shopping lists of desired behaviours as instruments of student assessment and is in line with Bruce’s proposals for a relational approach [1]; and

(2) that information literacy could stand alone as a subject for teaching and learning in its own right. Some commentators have argued that information literacy should be taught in the context of other subject-specific classes (see, for example, [3, pp. 81–3] and [35]).

The channels for delivering the class were: lecture slots (which included small group discussions, etc); computer labs; tutorials; e-mail discussion list; website...
with information and links; guest speakers (relating their own view of information literacy); printed handouts.

3.2. The context for the information literacy class

The University of Strathclyde, based in central Glasgow, has approximately 14,000 students. Undergraduates in the Business School are normally admitted to a faculty, rather than a particular course of study. At the end of the third year, successful students may graduate with an ordinary degree, but the majority go on to the fourth, Honours, year. This four-year programme is typical of Scottish universities.

For their second and third years, students choose two subjects in which to specialise, but may take additional classes. Information literacy is one such optional class. This one-semester credit-bearing class is run jointly by Strathclyde’s Department of Information Science (where Webber was based until July 2000) and the Centre for Academic Practice. The Centre for Academic Practice is a university-wide central academic service, with a remit to promote effective teaching and learning, conduct research into teaching and learning and deliver training and professional development to both faculty and students.

The class was first offered to undergraduate students within the Business School in the session 1998/99 and there have been approximately 50 students in each year. There were students studying various combinations of subjects, such as marketing, economics and law.

3.3. Learning objectives and content

The aims of the information literacy class are to provide students with a foundation in information seeking and communication skills, to enable more confident and competent performance during degree studies, enhance employability and contribute to their capacity for lifelong learning [36].

For the students, we highlight seven themes, as follows.

(1) Information literacy as a concept (including developing a sense of oneself as an information literate person).
(2) Communicating with people and organisations.
(3) Searching and browsing.
(4) Selecting and evaluating information.
(5) Team skills.
(6) Writing appropriately and effectively.
(7) The information economy.

Topics one and two are revisited in different ways throughout the semester. Topics three and four are frontloaded into the first half of the semester. Topics five and six are mainly considered in the context of the assignments. The final topic is covered in the second half of the semester.

The teaching and learning strategy is reinforced and integrated by the nature of the assessed assignments. The first is an individual assignment, while the second is a group assignment. Between them, they require students to:

(1) select disciplinary topics and business organisations for investigation and evaluation;
(2) negotiate topics with tutors and with other students for the team assignment;
(3) work individually and as team members;
(4) apply concepts and techniques critically; and
(5) include reflective accounts of their learning processes in all written reports.

3.4. Students’ definitions of information literacy

Since an aim of the class is to encourage student reflection on information literacy, as applied to their own situation, a vital part of the student response is their (changing) perception of information literacy.

Students were asked at the start of the semester to address the questions ‘What is information literacy?’ and ‘Why do you want it?’ in both years of the information literacy class. They did this in small discussion groups in class and the resulting statements were presented to the rest of the class and posted on the class website. The statements from 1999/2000 are available in full on the Internet [37]. We also analysed the statements from the 1998/99 and 1999/2000 cohorts broadly by theme and this analysis is presented in Table 2. There were twelve sets of statements from the first cohort and nine from the second.

In the 1999/2000 class, at the end of week five, there was a second exercise, with first-year students from Sheffield University. We asked the Strathclyde information literacy students to form groups in class and draw up statements about the value they felt information literacy would have for first-year undergraduates (these are available in full on our website, as are the responses from the Sheffield students [38]). The statements were a response to the question ‘What information literacy skills are most important for first-year students to acquire and why?’ We similarly analysed the eleven statements from this second exercise by theme. The results are also presented in Table 2.
In the first exercise, the students sometimes used similar wording to describe both information literacy as a topic and its benefits to them; a couple of groups just provided one overall statement. Therefore, Table 2 does not differentiate between ‘definition’ and ‘benefit’ statements; however, the themes starting with the words ‘Useful . . .’, ‘Help . . .’ or ‘Improve . . .’ were mostly identified in the ‘Why we want information literacy’ sections.

It is worth noting that all of the characteristics or benefits listed by the students had also been highlighted in the leaflet describing the class (mailed to all prospective third-year students shortly before the semester started and available on the class website [39]). Their view of the subject is likely to have been influenced by this. When designing the class, we aimed to reflect (using Bruce’s model: see Table 1) a knowledge extension conception of information literacy. However, we did stress the practical benefits of the class in order to ‘hook’ students. Therefore, the promotional leaflet possibly conveyed more of an information sources or information control conception.

Similar benefits were also mentioned by students in their assignments, when they were asked to relate their experience in the class to a model of information literacy.

4. Discussion arising from the information literacy class

4.1. Matching students’ views of information literacy (Table 2) with the models of Bruce (Table 1) and SCONUL (Fig. 2)

Only a broad comparison is attempted here, particularly since Bruce’s phenomenographic approach involved an initial detailed study of individuals’ conceptions of information literacy.

In terms of Bruce’s seven faces of information literacy (Table 1), there seems to be most emphasis on the information sources and information process conceptions (reflected in words such as searching and evaluating).
The emphasis on the role of IT in the first exercise also indicates some alignment with the IT conception. There is less evidence of an information control conception (using information more effectively, saving time) and knowledge construction conception (applying the information to improve their performance in a particular subject or their quality of life). Few of the statements put together in group discussion fitted into a wisdom conception or a knowledge extension conception.

The features of information literacy highlighted by the second cohort in week five of the class are similar to those mentioned by them at the start of the semester. However, it can be noted that the importance of being able to identify relevant information and the opportunities to be more efficient and save time seem to have increased in importance. The ‘Understanding computer technology’ benefit is not mentioned at all, which might indicate a shift away from the IT conception of information literacy.

In the reflective accounts submitted as part of written assignments, some students explicitly identified a further transition, revealing elements of a knowledge extension and knowledge construction conception of information literacy, for example:

Whereas before I perceived being information literate as simply knowing how to search for information, I now see it as a deeper, more psychological outlook. Becoming a critical thinker and adopting a learned approach when it comes to searching, organising and evaluating information is part of it. It also entails changing one’s mindset as to how to approach the world around one. Information literacy, in my opinion, is as much about the way we think as the things we do.

[Third-year student, marketing and business law, second cohort, in first assignment]

Comparing the group statements, and individual accounts of information seeking in assignments, to the SCONUL model, a progression could certainly be observed for some students during the semester. This was most obvious for those students who lacked some of the basic library and IT skills (e.g. ability to search the catalogue effectively) and who, by their own account and from our observation, improved their performance during the class.

As will be discussed further below, the aim was to stimulate the students to compare and evaluate through the learning and teaching methods employed. The statements in Table 2 again do not relate much to the seventh pillar (‘synthesise and create’) and there is a focus on the middle pillar (‘locate and access’). Comparing the definitions produced midway through the class with those produced at the start of the class, there is increasing weight given by the students to evaluating and organising information. This also emerged in comments in the written assignments, for example:

It was vital that I discovered my capabilities as an organiser throughout this assignment. This is due to the fact that an immense number of information sources were recovered and therefore must be categorised (relating to subtopics) and ranked in order of relevancy.

[Third-year student, management science and finance, second cohort, in first assignment]

To summarise: students readily identified information seeking and sources in their conception of information literacy. To start with, they did not necessarily have a clear conception of information literacy being a separate topic from IT. However, as the class progressed, students increasingly identified evaluation, application and organisation of information as being subjects distinctive to information literacy and they were less likely to refer to information literacy as being about IT.

4.2. Information literacy and pedagogy

Students’ response to the mode of teaching and learning in the information literacy class was gathered in class discussion, through observation, through a tutorial, which included study of an article by King [40], and in a class review. Some relevant comments also emerged in student assignments. The article by King contrasts the transmission mode of teaching (‘sage on the stage’) with an approach which is more interactive and student-centred (‘guide on the side’). King’s approach is compatible with a constructivist approach to education (see, for example, Brandt’s [41] discussion of the use of constructivist ‘mental models’ in information literacy).

In tutorials, there was acceptance that the King view of teaching and learning is valid and in line with students’ own experiences, i.e. active, information seeking, constructivist approaches make for better understanding and retention, while passive listening to lecturers (although easier) results in boredom, exam cramming and poor retention. The King view was also seen as relevant to defining and understanding the nature of information literacy. At the same time, students stressed the value of integration and guidance from class tutors. This relates to the King notion of facilitation being an important part of the ‘guide on the side’ role.

As part of discussion in one of their written assignments, some of the students contrasted the ‘transmission’ approach taken in some disciplines (King’s ‘sage
on the stage’) with a more interactive approach in other classes (King’s ‘guide on the side’). The latter approach tended to be preferred by students, for example:

When information is reconstructed in a personally meaningful, or new, way, it is more likely that the information will be remembered and consequently be able to be applied in new situations . . . The process of learning doesn’t end; there is always more to learn. This occurs because, when there is a cultural change, you apply yourself to new technology and are consequently learning again.

[Third-year student, economics and finance, second cohort, in first assignment]

Referring again to the SCONUL model for information literacy (Fig. 2), there is a match between verbs used to express the ‘top’ pillars of the SCONUL model (e.g. ‘compare’, ‘evaluate’, ‘apply’, ‘synthesise’) and verbs used by educationalists to describe generically higher-level learning outcomes. For example, Barnett [42] has argued that a major teaching goal should be the development of wisdom, defined as ‘a form of deep reflection, collective exchange and a recognition of or perhaps even a critique of inner values’.

If teaching, learning and assessment methods are to be aligned in the manner advocated by, for example, Biggs [43], then it follows that the top pillars of the SCONUL model need to be addressed by a learning and teaching strategy which incorporates evaluation, comparison, reflection and exchange of views. This also seems to have implications for information literacy’s place within the curriculum. If the student is to be able to reflect on and sustain his or her progress, and appreciate the linkages between the various pillars, then he or she will need time to develop. If assessment is to be part of the process, then, given the increasing unwillingness of students to devote time to outputs which do not count towards their official progress, credit-bearing classes would also seem to be necessary as the context for information literacy. Hepworth [35] has noted that ‘methods of assessment have to be defined to ensure that information literacy and skills are assessed and hence taken seriously by students’. He also highlights that academics may have an imperfect grasp of information literacy.

It is contended here that, from a pedagogic perspective, information literacy needs attention in its own right and should not always be subordinated to another discipline. While integrating information literacy into other parts of the curriculum may have an attraction, the danger is that students learn in snatches and do not develop a coherent conception of what information literacy means to them. In the introduction to the ACRL [11] information literacy competency standards, the appropriateness of learning and teaching methods such as problem-based learning is highlighted. This form of learning does certainly involve greater use of, and skills in, information handling. However, the emphasis in the ACRL standards seems to be on the way in which these methods can be used to improve deep learning of other disciplines.

This begs the question of whether a student will be encouraged to reflect on him- or herself as an information literate person as well as (for example) a good medical student. An effective learning and teaching strategy will include a period in which students experiment and experience. However, full benefit comes from encouraging the student to reflect on the success of that experimentation, to compare that particular experience with the experience of others and with their own past experience and thus to create their own, evolving model of good practice. If reflection and reward is only focused on the discipline-specific problem, then experiences relating to information literacy may remain disconnected, unevaulated and unconsolidated.

Additionally, it was found that students in the information literacy class responded positively to discussion of the learning and teaching methods themselves. Some students were (after two years of university education) keen to match up their observations of teaching practice with theories about teaching and learning and they produced their own relevant examples. While it would be unwise to make this topic too dominant, it fitted comfortably into the theme of communicating information. It provided a pathway into consideration of what needed to be learned about information literacy and what the students’ own contribution to that learning might be. It also opened up discussions on the relative value of academic staff, librarians, colleagues, the library, etc. as information sources, as well as providing feedback on the methods the authors themselves were using, in a non-adversarial manner.

One area where it was increasingly felt that further research was needed was that of appropriate pedagogic methods for information searching and browsing. A great deal has been written in the area of information seeking and user studies and there are very many case studies and how-to articles concerning information searching. There is also ongoing research into links between cognitive styles and information seeking [44]. Wood et al. [45] described research which investigates the links between cognitive style and searching behaviour and recommends that training in information searching takes account of differing cognitive and learning styles. However, in the main, research into
information-seeking behaviour does not seem to have had much influence on how information searching is taught to the majority of people. It is here hypothesised that users of information services are taught ‘how to search’ in much the same sort of way that they were being taught 20 years ago. The medium has changed in some cases (with more online tutorials), but the agenda (identifying sources, identifying search concepts, using Boolean logic, learning key commands or sequences, doing search exercises) stays much the same.

Fourie and van Niekerk [46] have noted that there is a paucity of studies on how to assess online searching skills. Studies such as those of Bilal [47] show that education in how to browse and navigate is also needed, not just education in how to search.

No ready-made solution is presented here. A first requirement is acknowledgement on the part of both student and trainer that undertaking an information-literate information search is not a skill that can be learned by rote, or quickly. Since education in information seeking is attaining a higher profile (e.g. the recent Digital Scotland Task Force report [48] notes that Web navigation and information extraction skills are vital for young people), there is some urgency in addressing this area.

4.3. Information literacy as a discipline

The first and most obvious point is that the students in this study accepted information literacy as a valid topic, with its own theory and practice. Once a subject has achieved credit-bearing status, students are likely simply to accept that it has some weight. It seemed to go further than this, though, in that students responded positively to it as a worthwhile topic of study.

As indicated in Table 1, many of the students identified information literacy as being directly beneficial when they formulated statements about information literacy. This was also stressed in student essays, for example:

In the context of lifelong learning, I feel this project has allowed me to build a solid foundation for my future data gathering technique. Economics is very much a research-based profession; moreover, the more efficiently and effectively you gather your data, the better you do your job and the quicker you gain promotion – or so the theory goes.

[Third-year student, finance and economics, first cohort]

Knowing about IT and information literacy are key skills nowadays, they are the next skills to be required by employers, just like Maths, English, etc.

[Third-year student, tourism and marketing, second cohort, in first assignment]

There were comments from individuals in tutorials and in the assignments that they had learned a great deal about information and learning so far and were revising their understanding of their own learning. This often took the form of commentaries on approaches to study in earlier years of the degree: some recognising that they had missed out through not knowing enough about finding information; some indicating that they perceived good information skills as a significant factor in getting better essay marks through being able to cite more or newer material. For example:

Prior to carrying out this exercise, I had, of course, researched for various essays over the last two years . . . Previously, I had relied on the reading list for a class to provide relevant sources, mainly because I did not know where to start to find original reference material . . . critical evaluation is required to plough through the quantity but not necessarily quality of information.

[Third-year student, economics, second cohort, in first assignment]

I became much more selective in the information I chose, which in turn boosted my confidence in the work I was producing as I knew it was up to date and innovative.

[Third-year student, marketing and geography, second cohort, in first assignment]

The feedback that was elicited in this area seems to demonstrate that information literacy can be taught as a stand-alone subject in its own right and does not have to be incorporated into other classes in order to be meaningful to the students. The students were able to apply information literacy within other subject domains on their own initiative.

When this class was first proposed, it was, in a spirit of pragmatism, the ‘skills’ aspect that was emphasised most. From a faculty perspective, this made the class appealing as a response to the Dearing ‘key skills’ agenda and it was also felt that it was more likely to attract students by stressing the practical content. However, experience of running the class twice has strengthened the opinion that providing a theoretical framework is beneficial to the non-library and information student.

For some students, it was a revelation that the processes of information retrieval and information use could be looked at in a systematic way. Many of them had not reflected on how or why they gathered (or failed to gather) information for work or leisure. As indicated already, some students were enthusiastic in identifying specific ways in which the new awareness of this process had made them more efficient and effective. The popularity of search engines seems to have made information retrieval less of a minority interest:
This assignment has been the first chance I’ve had to actually take a step back and analyse the new and fairly incredible methods of data collection, evaluation and processing available today.
[Third-year student, business law and marketing, second cohort, in first assignment]

While practical searching techniques were of most interest, students seemed to appreciate being introduced to models of information seeking (such as Ingwersen’s model of data types and information retrieval behaviour [27, p. 9] and information encountering [49]). As business school students, they were interested in the impact of new communication methods and new media for information on business:

Knowledge is not static, and neither are the skills required in different jobs in an ever changing environment.
[Third-year student, human resources management and finance, second cohort, in first assignment]

[In a business environment] the main purpose for searching relevant information will be for making decisions and setting strategy.
[Third-year student, electronic engineering and marketing, second cohort, in first assignment]

Throughout the information literacy class, the aim was to position individual topics within the seven themes already mentioned (Information literacy as a concept; Communicating with people and organisations; Searching and browsing; Selecting and evaluating information; Team skills; Writing appropriately and effectively; The information economy), to highlight the interaction between the thematic areas and to address the themes from different perspectives (theoretical and in relation to different groups and individuals).

Although one of the authors has moved to another institution, the class will continue to be delivered by the two departments in future years (the move will also provide a useful platform for further interaction between Strathclyde and Sheffield students, building on the exercise outlined in section 3.4 above). For future years, the aim is to develop this further, in terms of expanding the themes (e.g. into the area of information management) and providing further theoretical constructs. The students’ personal construction of the discipline (through individual and group reflection at regular intervals) will continue to be a focal point of the class. However, the authors now feel more confident in presenting the students with a wider range of models to explore, learn and critique.

As already noted, there is a substantial literature which discusses the scope of information science and its relationship with other disciplines and there are many articles and reports which provide lists of topics related to information literacy. However, it is contended that there is a need to delineate information literacy as a subject of study in its own right. The vocational nature of the discipline is implicit in definitions of information and library studies that are produced for the accreditation of credit-bearing courses (e.g. the Institute of Information Scientists’ criteria mentioned above [31] or the UK benchmarking document for librarianship and information management [50]).

Guidelines which are intended for instructors of non-information-specialists, such as the ACRL [11] information literacy competency standards, take an enumerative approach which does not seem appropriate to higher education. The ACRL guidelines in particular concatenate outcomes of different kinds. There are outcomes which could be seen as indicating the level of learning rather than an information literacy skill or knowledge set (e.g. [the student] ‘reflects on past successes, failures, and alternative strategies’), outcomes which relate very specifically to information searching (e.g. ‘reviews search strategy and incorporates additional concepts as necessary’) and outcomes which imply a whole raft of further knowledge and skills (e.g. ‘incorporates principles of design and communication’).

Standards and outcomes are, of course, valuable in the educational context. One would, however, expect to see more extensive discussion of the nature and definition of the discipline accompanying the standards and for this definition to be foregrounded. The removal of a disciplinary context encourages both educator and student to treat the subject as a bundle of separate skills. This may reinforce the students’ idea that the subject has no underlying coherence or theory and is not to be treated as a serious subject. It may also cause pedagogic harm, in hindering students from constructing a holistic view of information literacy and discouraging them from exploring the connections between different aspects of the subject and the interplay between information literacy and its related disciplines.

Assuming that information literacy is primarily taught by librarians, the ‘skills list’ approach may also reinforce academics’ preconceptions that it is not a proper subject and that it can be picked up in a few hours. The approach is perhaps indicative of the extent to which library and information professionals have been demotivated over the years by those who underplay the amount of skill and knowledge required to achieve all the outcomes on the ACRL list. This could be a vicious circle: librarians respond to inadequate time-slots by slicing the subject down to what can be fitted into the slot, while academics assume that this
means that a short time-slot is adequate. The topics normally identified with information literacy include complex problem-solving areas which even the most gifted educator would be hard-pressed to transmit in a one- or two-hour time period.

5. Conclusions

It is concluded that there is scope for further research and discussion in the following two key areas: research into appropriate pedagogic methods for information literacy and defining the discipline of information literacy.

5.1. Pedagogy for information literacy

There would seem to be ample scope for further research in a number of the areas which have been discussed. Learning and teaching methods in information seeking have been highlighted as a possible priority area. However, there is scope for investigation of many aspects of how information literacy is best learned and assessed. In the educational field, it is now controversial to say that curriculum design needs to address how a subject is taught as much as it addresses what is taught. For example, Bruce’s [1] proposed outline for a relational approach to teaching information literacy could be tested further.

There is also work to be done in uncovering current practice. Mapping a holistic picture of how and where information literacy is taught would provide a basis for exploring in more depth the student experience and response. The SCONUL briefing paper [14, p. 7] notes that, although there is much activity, there is not a coherent approach to the development of information literate people in UK higher education: ‘Much is left to the initiative and actions of small groups of interested staff (both librarians and subject teachers), working in pockets and with no overall framework’.

A challenging but valuable avenue would be to explore the possible link between the way in which students experience information literacy and their level of engagement (surface or deep) with other assignments. As was noted in section 2.3 above, there are indications that those who take a more analytical, reflective approach to information seeking are also likely to engage more reflectively in broader tasks which involve information evaluation and synthesis. It would seem worth investigating further whether changes in students’ experience of information literacy (moving from a process or IT focus towards (in Bruce’s terms) a ‘knowledge construction’ or ‘wisdom’ experience) might lead to deeper engagement with other subject areas.

5.2. Definition of information literacy as a non-vocational discipline

There are more than enough definitions which enumerate characteristics of information literacy. What is needed is further analysis of information literacy as a coherent field of study. Information science, rather than librarianship, provides a more logical starting point, since the vocational and intermediary aspects of librarianship are fundamental to that discipline. As already noted in section 2.4, the statement which introduces an outline of the topics encompassed in the core area of the Institute of Information Scientists’ criteria [31] seems compatible with most definitions of information literacy. The more detailed criteria could form a starting point for debate. Another exercise might be to examine the interaction with other disciplines. Taking Ingwersen’s map (see Fig. 3), it is suggested that computer science and mathematics would be more distant influences on information literacy and that education, management and (for those who see it as a separate discipline) media studies would be more important influences.

Information literacy is differentiated from information science in the emphasis on the individual within the world of information and the movement away from an intermediary role. It provides an interesting shift in perspective: away from the study of information users, in order better to design systems and services for them, and towards the study of one’s own and one’s colleagues’ information style and preferences, in order to develop a more effective information style and information literacy for oneself and to organise information systems and services in tune with one’s needs. Aspects of information management are thus also encompassed within information literacy.

In the management field, a focus on the individual manager for some educational purposes has not invalidated the research agenda. Changing social and economic contexts have led to a change in perception, from seeing management as an academically minority topic (something that anyone could do, without the need for study) to more widespread acknowledgement that management theory may be of help to a wide range of managers, and subdividing of the discipline. There could be a similar progression for information science and information literacy.
5.3. The future?

The shift away from the citizen as someone who has information services done to them, and towards the citizen as an agent who can reflect and develop his or her own approach to information literacy, is effectively happening already, as information skills training becomes more prominent in schools and universities. It may be, as one of the students said, as quoted above, one of ‘the next skills to be required by employers, just like Maths, English, etc’.

Information scientists can take the lead in developing and defining this emerging area. Alternatively, we can continue to devise skill lists for our users and to peg out the boundaries of a traditional information science, while people from other disciplines – computing science, management science, psychology – define, and lay claim to, the information literacy field. It is up to us.

References

[23] M. Petrowski, quoted in: Institute for Information Literacy, Other Information Literacy Resources (American Library Association, Chicago, IL, 1999). Available at: http://www.ala.org/acrl/nili/readings.html


[37] Available at: www.dis.strath.ac.uk/literacy/definitions99.html

[38] Available at: www.dis.strath.ac.uk/literacy/sbsclass99.html


