This inaugural edition of MJET is dedicated to Alex Moon (1970 - 2010), the founding editor of the journal.

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Information Literacy: A 21st-century Graduate Skill

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Abstract

There is a heightened awareness in higher education of the crucial role of information literacy in teaching and learning. The paper defines information literacy; encourages collaborative partnerships between academic teaching staff, librarians and learning support staff; and proposes an institution-wide systematic development of information literacy in teaching and learning. The paper also makes reference, from a librarian's perspective, to some of the key findings of a study undertaken by researchers at Middlesex University on user behaviour in the electronic environment specifically as it relates to information literacy in the academic context. The paper proposes a way in which these skills can become integral to the teaching and learning strategy of a higher education institution in the second decade of the 21st century.

Keywords: information literacy, digital literacy, 21st-century literacies, user behaviour, electronic resource discovery systems

Introduction

Coming into frequent contact with the digitally savvy young students who spend a large proportion of their time in social networking activities on their smart phones, we may be forgiven for being seduced into imagining that if we put them in front of electronic information resources in our digital libraries, it will be plain sailing; these young students will take to searching and accessing electronic resources appropriate for academic study like ducks to water. The User Behaviour in Resource Discovery (UBiRD) study (Wong et al., 2009) found the opposite to be the case and confirmed that there is a huge gap between perception and reality, between students' apparent ability to use digital technologies and their actual ability to conduct even a basic search using electronic resources in a learning situation. Several other user behaviour studies further support the hypothesis that the digital information seeker is not as information literate in an academic context as has been assumed (see: JISC, 2010 for a list of user behaviour studies). The so-called 'Google Generation' (used to describe people born after 1994 and popularised by the jointly funded JISC and British Library CIBER Report Information behaviour of the researcher of the future, [JISC, 2008]) and their competence in searching and finding appropriate materials for academic study is a hotly debated topic both within the library and information science profession and among educationalists. However, it appears that this debate is not that new. As early as 2004, in her article on the information seeking behaviour of 'Generation Y' students (that is, people born between 1978 and 1993), Angela Weiler raised concerns about the critical thinking and cognitive skills of these students because so much of their time was spent in front of electronic screens 'passively absorbing words and images, rather than reading' (Weiler, 2005, p. 46).

The current generation, the Google Generation, uses more advanced interactive digital technologies in ways that appear far from passive, most obviously in social networking and in online gaming. However, when it comes to evaluating the value and relevance of large amounts of information they may find on the internet, a certain passive acceptance is more common than critical engagement.

'Information literacy' remains a somewhat misunderstood term. The terms 'Information Competence', 'Information Fluency' and 'Information Mastery' have been used interchangeably in the past to capture the essence of what is meant by being information literate (Bowden, 2006). More recently, much has been written on the various online discussion lists, specifically in relation to the digital literacies framework (which includes digital literacy, information literacy, critical thinking, reading and writing skills) which is being proposed in the Learning Literacies in the Digital Age report (JISC, 2009). The Chartered Institute of Library & Information Professionals (CILIP) defines information literacy as 'knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner' (CILIP, 2009). This straightforward definition implies several skills (or competencies) that are required to be information literate. These are listed below and can be categorized into three key actions—Finding, Evaluating and Using:

The need for information	
Access to resources	FINDING
Skills in finding information	
Appropriateness in relation to need	EVALUATING
Skills in exploiting search results	
Awareness of ethical issues in the use of information	
Communicating/presenting information	USING
Skills in referencing and citation	

Figure 1: Finding, Evaluating, Using

In the digital landscape in which we operate today, information literacy skills cannot be developed without appropriate information technology skills. In order to FIND relevant and quality information resources that are appropriate for academic study, students must have the prerequisite IT skills to use electronic resources. Students need to be able to use a computer effectively in order to search for content. Competence in this respect can be defined as the ability to use technology effectively in order to operate the user interface of a searching facility such as an online catalogue or an electronic index/database, and to have a basic understanding of how this interface works to enable intelligent searching.

Achieving competence in the use of IT will help users to focus on search results and EVALUATE the information retrieved in order to gauge usefulness or appropriateness. An evaluation of the information found can also answer the question of how the search could be re-formulated or re-structured in order to yield better search results. This is where information literacy skills kick in—when sense is made of the information found through analysis and synthesis. All of this requires critical reading and thinking skills for the information to be USEd and presented in an ethical manner listing sources consulted using the conventional referencing styles.

The Society of College, National and University Libraries' (SCONUL) 'Seven Pillars of Information Literacy' diagram illustrates the close relationship between IT and Library (information research) skills and the progressive development of information literacy suggesting that these competences need to be taught over a period of time in order to develop the learner (SCONUL, 2009).
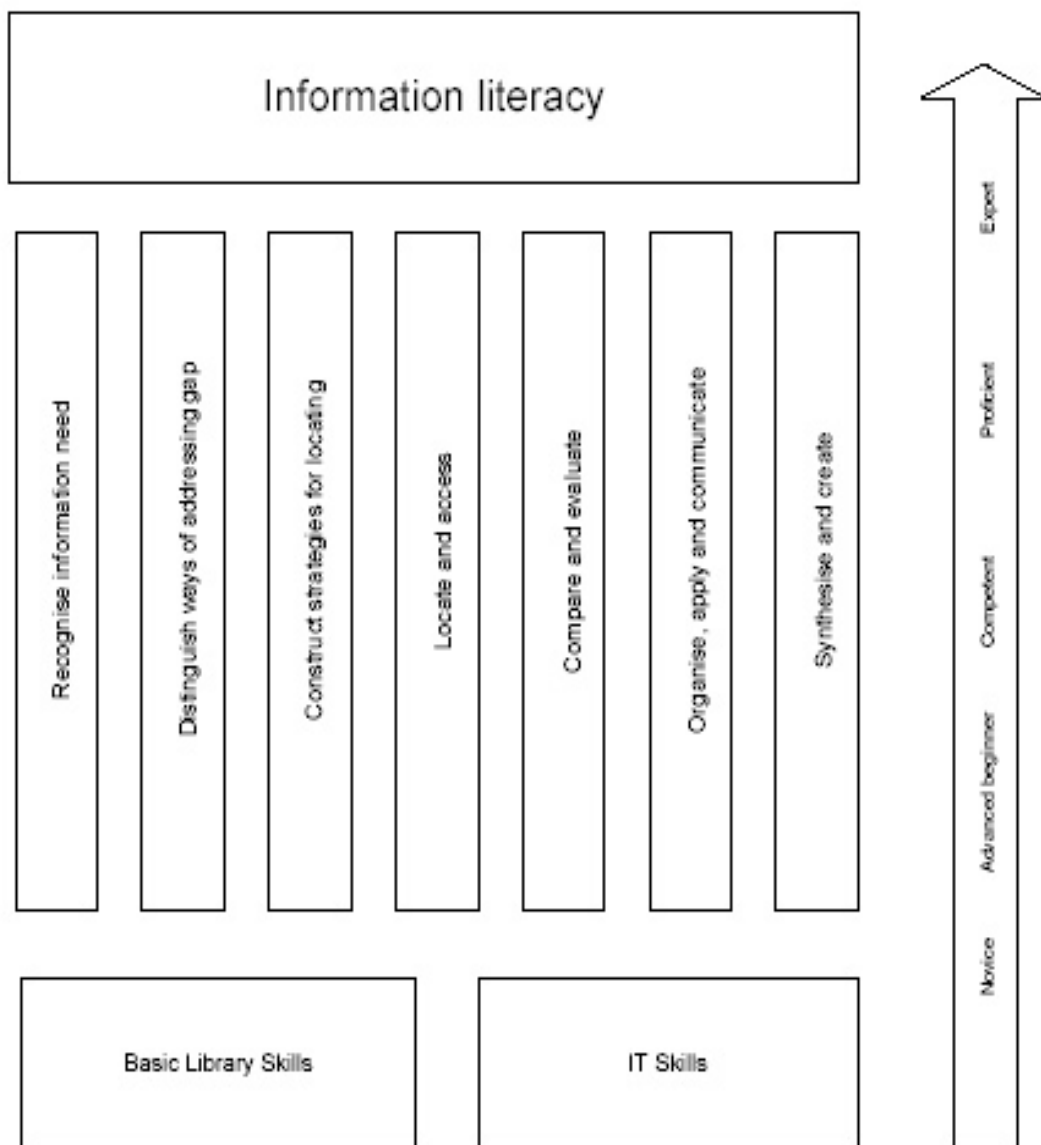

Figure 2: SCONUL: Seven Pillars of Information Literacy

In order for these skills to be harnessed effectively, the teaching must be placed within the subject context. Teaching students information research skills outside of the subject context, in isolation to what is taught in the curriculum, is a waste of time and resources as students have themselves confirmed in interviews on their prior experience of using libraries (Wong et. al., 2009). Furthermore, the timing of this teaching needs to anticipate coursework deadlines or work that is undertaken in preparation for an exam to make it even more relevant to the student. This paper proposes a number of shifts in attitude and practice that are necessary in order to embed these literacies into the curriculum so that they become integral to the teaching and learning strategy in an higher education institution. However, I wish to refer first in more detail to the findings of the recent User Behaviour in Resource Discovery study, UBiRD.

The UBiRD Study

The UBiRD study looked at the information-seeking behaviour of thirty-four undergraduate and postgraduate students studying Business and Economics at three higher education institutions in the UK: Cranfield University, the London School of Economics, and Middlesex University. Students were given three tasks, beginning with a simple search and moving to tasks of increasing complexity, all of which required them to find appropriate information resources for a given topic. The study was based on qualitative data obtained from both an observational study (recorded video evidence shows how users interact online and search on a variety of freely available information resources and library subscribed electronic resources) and in-depth interviews with the participants. The analysis of the data provided the following: an understanding of why certain resource discovery systems were chosen by the participants, how students searched and the search strategies they employed to seek information, the issues that affected their searching and an appreciation of the problems and difficulties students experienced with accessing both print and electronic library resources.

The UBiRD study revealed that information literacy overlaps somewhat with information technology literacy because so much of the information available today is in electronic/digital format. There is a clear implication that students need to have competence in both IT and information literacy skills. However, the ways in which students formulate their queries is highly dependent upon the functionalities provided by these information systems, whether they are databases or popular search engines. Indeed, it is possible to argue that the mental frameworks required for the use of information technology are fundamental and the famous dictum, 'the limits of my language mean the limits of my world' (Wittgenstein, 1974, p.115) is wholly appropriate in this context.

Interview responses from students on the UBiRD project demonstrated that while most higher education institutions provide basic information skills training and library support to students in some form or another, for many these sessions predominately take place during induction week when students are familiarising themselves with their new institution. This is not always the best time for teaching library and information skills as many of the students who were surveyed complained about an

information overload at the start of the academic year. Information given at this time is not relevant and too general to be of immediate use and also outside the subject context. This information is therefore quickly forgotten.

The study also revealed that many students did not receive any subject-specific information skills training after the induction period because this training was not built into the curriculum. Many undergraduate students confirmed that they were unaware of library electronic resources for the entirety of their first year. This was primarily because, in the majority of cases, their coursework did not require them to go beyond the internet to find information sources. This in itself may not be bad news if it is part of a deliberate strategy by academics working closely with librarians to develop a gradualist approach to information literacy with a clear intent to introduce more advanced skills and awareness of library subscribed electronic resources in the second year. However, it rarely is. The development of advanced information literacy skills is too often dependent on the natural wit of the student, the chance encounter with an enlightened academic who has foregrounded skills development in a particular module, or a very valuable one-to-one session with a librarian.

The UBiRD study offered extensive evidence that participants want quick, easy and unproblematic access to resources and to the downloading of information resources. One of the key problems is that often, in order to locate desired articles, the user has to search across several different databases that have different search interfaces. The simple search interfaces available on Google and YouTube, for instance, have falsely led the user into believing that all searching is easy, so much so that the 'Advanced Search' facilities on Google and Google Scholar are almost always ignored. Faced with the myriad of different searching platforms, not to mention the multiple ways library subscribed resources can be accessed, that is via the library's website, the publisher's website, the institution's VLE and/or via a popular search engine (such as Google or Google Scholar), the student is immediately in unfamiliar territory. This can be both frustrating and disappointing especially if the initial searching has been unproductive. There is therefore a gulf between what the user expects the system to be capable of, and what the electronic resource discovery system is capable of supporting.

The study revealed that users often reverted to resources or practices they were most familiar with, including obtaining information from their friends at other higher education institutions and members of their family. Most participants chose Google as their first port of call. Participants' choice of resources was inevitably determined by their domain knowledge, prior knowledge about available resources that would provide information on the specified topic and the knowledge about the content, structure and experience of using familiar search engines. In contrast, users accessing library-provided 'academic' databases had to begin with some knowledge of which database to search (from a long list of databases for every conceivable subject), how to authenticate and how to access the database in order to then being searching effectively using the appropriate terms.

The UBiRD research reported very little application or knowledge of Web 2.0 tools in the resource discovery process by the participants. In fact, the assumption that has been made, that present day users are discerning in their use of social networking Web 2.0 technologies, is inaccurate as suggested in the opening section of this paper. While a number of users may be familiar with information-sharing technologies such as Facebook, Twitter, Delicious and so on, there is little evidence in the UBiRD study to suggest that users' knowledge of such technologies is being applied to the search and retrieval tasks in electronic resource discovery. In fact, one user was disconcerted when he came across Delicious bookmarks on the London School of Economic's library pages for Business and Economics. What was observed was that students use their personal social networks whether they are on Facebook, MSN (chat) or email to seek advice from their friends or people they know who have the information that is required. Minimal evidence of the use of Web 2.0 tools to help or integrate their resource discovery activities confirms that being socially active in the digital arena does not necessarily mean students can apply their knowledge of these technologies in an academic context. A real pedagogic challenge presents itself in devising a way to enable students to transfer their social IT skills in ways that significantly enhance their academic competence.

Meeting the Pedagogic Challenge

In light of the above, and considering the CILIP definition and SCONUL's seven pillars of information literacy, it is clear that a path needs to be forged to ensure that there is a systematic and progressive embedding of the required skills into the curriculum. This can only be achieved if support staff (in the library, in IT and in language support that teach academic reading and writing) and academics work in partnership. Furthermore, this collaboration needs to consider not just the content of workshops/seminars but how the content is delivered, that is, whether it is face-to-face, online using emerging technologies or a mixture of both. The timing, that is, when it is most appropriate for the skills to be taught, and how they will be assessed are also important considerations.

Academic staff can work with library staff so that resources relevant to the assignment/project are introduced to students at the appropriate times. Co-ordination between IT staff, librarians and language support staff is important so that students have the necessary referrals for support depending on needs. Of equal importance is the assessment of information literacy and the workshop content. It is necessary to assess information literacy skills in order to ensure that students demonstrate the use of quality resources, such as, for instance, the use of peer-reviewed journal articles and recommended websites, and critical evaluation skills in their choice of information resources used in their work. The assessment task can take the form of a literature review and/or an annotated bibliography, which clearly demonstrates the criteria used for selecting information resources for the assignment. All of this requires a much more integrated cross-university approach, in which teaching and learning teams work in a coordinated way to deliver clearly defined learning outcomes. There are many examples of good practice in embedding information literacy into the curriculum within UK universities (Gaunt et al., 2009 and Information Literacy Research at Staffordshire University, 2008).

These developments at the institutional level would be much encouraged and practically supported by the development of a national strategy with an authoritative body defining information literacy standards and promoting pedagogic good practice, including the use of diagnostic testing of information literacy skills in learners. The JISC-sponsored Digital Literacies Pilot Project (which is still work in progress) and the recommendations of the Learning Literacies in the Digital Age report attempt a move in this direction and take further the digital literacies agenda to include e-learning and critical thinking skills (LLiDA-JISC, 2009).

Overall, we are in a situation where electronic resources and the technologies by which they may be accessed, together with changes in the broad social behaviour of the 'Google Generation' have advanced far beyond current practices in library user education. We have also seen how fluency with operating information technology can be misconstrued as being information literate. From a librarian's point of view, the blurring of the boundaries between the two concepts may present significant problems in the future. Students often give the impression that they are fully familiar with information technologies and possess high-level searching skills when, in fact, there is a significant skills gap in evaluating the quality or usefulness of information found, refining their searches, and effectively integrating what they find into their knowledge and value systems. Working with what students know already and developing more advanced skills through relevant and interesting activities is sound pedagogy. In relation to managing a shift from one set of (social) behaviours and competences to another set (professional and academic), it is vital for librarians and academic staff to have a clear road map. This, arguably, will be provided by a definition of competence levels in searching, retrieving and using information.

The building of knowledge on sound information is crucial, not only in increasing the exploitation of extremely valuable online resources within the university learning environment, but more broadly in advancing democratic society. These skills are life skills and will be used throughout an individual's lifetime, in work and outside of work.

Proposal

Information literacy needs to be at the centre of teaching and learning strategies with a clear sense of shared purpose between all those involved in developing the graduate skills and competences of the university student. Close collaborative partnerships between teaching staff and support staff will ensure joined up thinking when designing a curriculum that develops the learner in a holistic manner. Thus, as mentioned above, the key issues to consider in the planning are:

- Collaborative working relationships: between academic and support staff to ensure joined-up thinking
- Subject relevancy: information literacy embedded into the curriculum so that it is subject specific
- Assessed: skills are assessed as part of the course work to see how the student uses information resources and demonstrates critical thinking, reading and writing skills
- Timeliness: skills are introduced when they are most relevant in the curriculum, i.e. before an assessed piece of work is due and

- Progressive: students are allowed to gain experience and develop the skills over time so that they become ingrained in their learning.

The above is proposed in order to ensure that all 21st-century literacies become an integral part of the teaching and learning strategy in higher education.

References

Beetham, H., McGill, L., & Littlejohn, A. (19 August 2010). Thriving in the 21st century: Learning Literacies for the Digital Age: Project Report. from http://www.caledonianacademy.net/spaces/LLiDA/

Bowden, D. (2006). Information literacy: the new knowledge management? Editorial. *Journal of Documentation, 62*(4).

CILIP. (19 August 2010). Policy and advocacy - Information literacy: the skills. from http://www.cilip.org.uk/get-involved/advocacy/learning/information-literacy/pages/skills.aspx

CILIP. (2009, 19 August 2010). Information literacy: the skills. from http://www.cilip.org.uk/get-involved/advocacy/learning/information-literacy/pages/skills.aspx

Gaunt, J., Morgan, N., Somers, R., Soper, R., & Swain, E. (2009, 19 August 2010). Handbook for Information Literacy Teaching (HILT). from http://www.cardiff.ac.uk/insrv/educationandtraining/infolit/hilt/

Information Literacy Research at Staffordshire University. (19 August 2010). from http://www.staffs.ac.uk/infoliteracy/research/

JISC. (2009a, September 2010). Information behaviour of the Researcher of the future. from http://www.jisc.ac.uk/publications/reports/2010/digitalinformationseekers.aspx

JISC. (2009b, September 2010). Learning literacies in a digital age. from http://www.jisc.ac.uk/publications/briefingpapers/2009/learningliteraciesbp.aspx

JISC. (2010, 19 August 2010). The digital information seeker: Findings from selected OCLC, RIN and JISC user behaviour projects. from http://www.jisc.ac.uk/publications/reports/2010/digitalinformationseekers.aspx

LLiDA- Learning Literacies for a Digital Age. (August 2010). from http://www.caledonianacademy.net/spaces/LLiDA/

SCONUL. (2009, 19 August 2010). Information Skills in Higher Education: A SCONUL Position Paper. from http://www.sconul.ac.uk/groups/information_literacy/papers/Seven_pillars.html

Weiler, A. (2005). Information-Seeking Behavior in Generation Y Students: Motivation, Critical Thinking, and Learning Theory. *Journal of Academic Librarianship, 31*(1), 46-53.

Wittgenstein, L. (1974). *Tractatus logico-philosophicus*. London: Routledge and Kegan Paul.

Wong, W., Stelmaszewska, H., Bhimani, N., Barn, S., & Barn, B. (2009, 19 August 2010). User Behaviour in Resource Discovery: Final Report. from http://www.ubird.mdx.ac.uk/wp-content/uploads/2009/11/ubird-report-final.pdf