Formalising information skills training within the curriculum: a research project at Southampton Solent University

Celia Forrester
*Information Librarian,
Leisure and Maritime
Mountbatten Library,
Southampton Solent University*
Tel: 02380 319684
E-mail: celia.forrester@solent.ac.uk

Scott Burnet
*Lecturer in Sport Science
(Research Methods and
Physiology)
Faculty of Business Sport and
Enterprise,
Southampton Solent University*
Tel: 02380 319692
E-mail: scott.burnet@solent.ac.uk

INTRODUCTION: THE INFORMATION LITERACY BACKGROUND

In an increasingly competitive graduate market there has been a greater focus on how to prepare students for life after university. Whilst subject-specific skills are important, there has been a drive to make students more information-literate and to facilitate independent learning in preparation for employment.[1] Bent and Stockdale argue that a university education should encourage students to view learning holistically: as part of everyday life and not simply confined to the lecture theatre.[2]

The formalised development of information literacy (IL) within UK universities has been comparatively slow compared with countries such as Australia or the USA.[3] This became apparent in 1999 when a task force convened by the executive board of SCONUL prepared a statement on the topic of information skills for higher-education students. What became apparent through SCONUL was that the United Kingdom has less

clearly developed thinking in this area than many other countries, which had been addressing the implications of the 'information society' more fundamentally.[4] In response SCONUL developed a framework and summarised information literacy into seven headline skills, or 'pillars', which ranged from 'an ability to recognise the need for information' to an 'ability to synthesize and build upon existing information, contributing to the creation of new knowledge'.

Since 2000 Southampton Solent University (SSU) has looked to address the concerns highlighted in the task force's report on information skills. To meet the challenge, librarians have provided information-skills handouts, online tutorials such as 'On track' and 'INFORM-e' and, more recently, within the virtual learning environment of myCourse, the succeed@solent areas, providing guidance on all aspects of research. Group and one-to-one training sessions on how to search for, locate and retrieve information and to correctly create bibliographies/reference lists have also been developed. However as Bent points out, 'students make poor use of the wide range of subscription and other higher-education funded electronic information sources and gateways. The preliminary evaluation of these students also indicates that they are very difficult to wean off a Google habit.'[5] In addition, Walsh and Radcliffe *et al*. suggest that subject librarians are granted too little time to work with students in a very complex field.[6] Attempts have been made to overcome this problem, with greater collaboration between academic and library staff and the development of an integrative IL curriculum.[7]

ASSESSING INFORMATION LITERACY

Considering the importance of student IL, both DaCosta and Dunn detail that assessment of such skills is essential to enhancing student performance and confidence in working with information from multiple sources.[8] Whilst there are numerous methods available to assess student competence in IL, the most common methods appear to be online multiple-choice question (MCQ) tests, analysis of bibliographies, assorted MCQ and short-answer tests and self-assessment forms.[9] Whilst MCQ tests generally measure knowledge and skills rather than understanding and practical application, pressures of teaching time and limited funding make the MCQ test an attractive option.[10] An example of such a test was developed by James Madison University (JMU), Virginia, USA, and was based on five standards proposed by the Association of Colleges and

Research Libraries (ACRL). These five standards to be achieved are shown in Table 1.

Table 1. The five IL standards proposed by the ACRL

Standard	Description
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	Uses information effectively to accomplish a specific purpose
5	Understands many of the ethical, legal, and socio-economic issues surrounding information and information technology

During the mid-1990s JMU developed a web-based information-seeking skills test (ISST), written in collaboration with the Centre for Assessment and Research Studies (CARS) and involving both librarians' subject knowledge and assessment specialists to provide psychometric expertise. In 1999 the ISST became a high-stakes test that all first-year and transfer students had to pass to continue studying at JMU. The IL skills tested were deemed to be crucial for empowering success in students' study skills and in life-long learning.[11] The results were used to measure the effectiveness of IL skills training and to identify where strengthening was required. In 2002, JMU libraries and CARS began to develop the information literacy test (ILT), which could be used by other institutions.[12] Griffiths and Glass have since reported that the ILT has become one of the most widely trialled information literacy tests commercially available.[13]

Funding for a collaborative IL skills project between members of the faculty of business, sport and enterprise and the library and learning services team at SSU was secured. The aim of the project was to evaluate the JMU ILT and identify whether it would be feasible to use the test as a tool to assess the information literacy skills of SSU's students and facilitate the greater awareness of skills desired by future employers.

METHODOLOGY

Participants
Eighty level-4 students from the faculty of business, sport and enterprise volunteered to take part in the study. The exposure to formally taught information literacy skills was mixed, with 62 students having completed a level-4 academic skills unit and the remaining 18 having had limited training in information literacy. Informed consent was obtained prior to testing.

Information literacy test (ILT)
Licences to complete the ILT were purchased from JMU, whereby an 'access window' became active and login details released. The JMU ILT was composed of 65 MCQs, which constituted four of the five ACRL competency standards.[14] Standard 4 was excluded, due to its applied nature and because it was inappropriate for the present situation. All questions were required to be completed.

Procedures
Under examination conditions in one of the university's IT suites, students logged on to the ILT through the JMU website. Standardised instructions were provided before the test, which included a clear statement on the formative nature of the assessment. Upon completion of the test, the results were automatically submitted to the JMU server. Test data were then relayed to the research team in the form of an Excel spreadsheet once the agreed 'test window' had closed. Students' perceptions of the ILT were obtained using an open-ended questionnaire.

Data analysis
Test data for each IL standard were summarised in the form of the mean and standard deviation (± SD), to identify strengths and weaknesses. Post-test questionnaires were analysed using basic content analysis to gather students' perceptions of the ILT.

RESULTS

Quantitative data
Results from the ILT were analysed for normal distribution using a Kolmogorov–Smirnov test ($p = .06$). The mean test score for the ILT was 56 ± 15% (see Figure 1). Students achieved noticeably higher scores in standards 1 ('determines the nature and extent of the information needed'), 3 ('evaluates information and its sources critically, and incorporates selected information into his or her knowledge base and value system') and 5 ('understands many of the ethical, legal, and

socio-economic issues surrounding information and information technology') – see Figure 2 – with mean standard scores of 59 ± 14%, 57 ± 12% and 53 ± 18%, respectively. Lower scores were recorded for standard 2 ('accesses needed information effectively and efficiently'), with a mean score of 40 ± 27%, indicating a considerable degree of variation in students' achievements in relation to this standard.
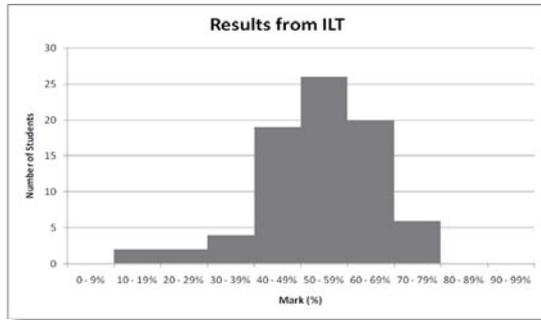

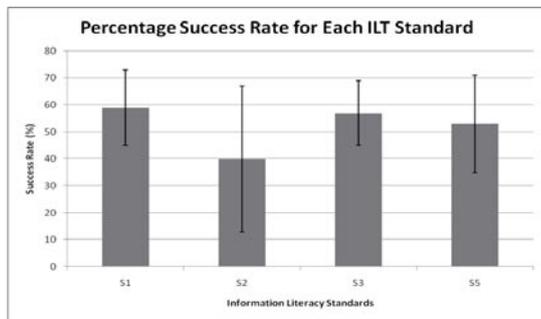*Figure 1. Results from the JMU ILT*

Figure 2. Percentage success rate for each ILT standard

Evaluation of qualitative feedback
Feedback from the questionnaire suggested that nearly all students who completed the ILT acknowledged its relevance for undergraduate study. The most frequently occurring comment concerned the excessive length of the test, and as such students found it difficult to maintain focus. Other issues that arose from the feedback can be viewed in Figure 3. One theme mentioned in the questionnaire – which was perhaps not detailed extensively but was expressed informally in conversation – was the 'American phases/terms' used.
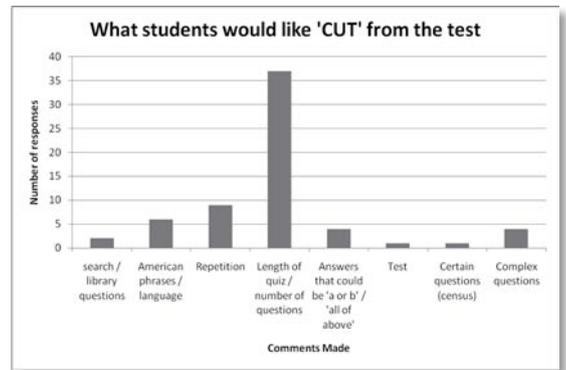

Figure 3. Student perceptions of the ILT that needed to be changed

In contrast, positive student perceptions of the test included approval of the MCQ format, the layout and the questions related to referencing. Feedback suggested that the students preferred the MCQ format because it was 'easy', 'quick' and they 'did not have to think too much'. In addition students remarked that the format of the ILT was logical and the variation in the sequence of questions (such as text, graphical or data interpretation) was preferred. The comments suggested that referencing is a key area of interest and is most beneficial to study.
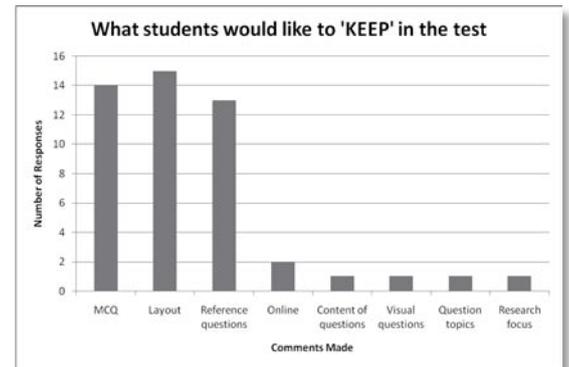

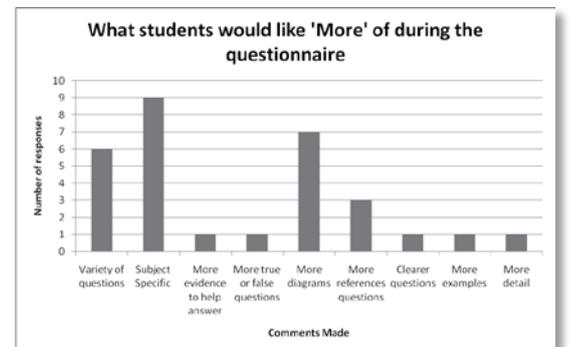*Figure 4. Positive student perceptions of the ILT*

Figure 5. Students' perceptions of how the ILT could have been improved

In terms of improvement, the most frequently occurring requests included subject-specific questions, varying the question format, more questions

concerning referencing and the inclusion of more diagrams.

DISCUSSION

General evaluation of test results
The issue of IL was officially addressed in the UK as far back as 1999.[15] Since then, appreciation of the importance of IL has accelerated, with the information environment evolving to increasing levels of complexity.[16] The current project set out to evaluate the JMU ILT and to ascertain whether it would be feasible to implement the test for undergraduate and postgraduate students studying at SSU.

Originally the project brief had been to formalise information-skills training within the curriculum, assessing the impact of current skills provision. In essence it had been hoped that the project would be used to evaluate the provision of current IL-based units at SSU in a test-re-test fashion (that is, pre- and post-test) but, due to logistical issues, data from the ILT could only be collected after the period-one IL units had concluded and not prior to commencement as planned.

The mean test score indicated that the pass mark was not attained. Cameron *et al*. stated that a proficiency pass mark of 65% was required.[17] To differentiate between the advanced and proficient students, a mark of 90% was required, which was surprising to the research team since the highest mark attained by LIS staff members was only 90%.[18] It should be stressed, however, that the marking criteria for each of the competency standards were not equal but weighted in terms of complexity. Standards 2 and 3 had the greatest weighting within the test (one-third of the marks respectively). The mean score for standard 2 was only 40 ± 27% and this could in part explain why the mean test score fell below the pass mark of 65%. Therefore students achieving higher pass marks in standards 1 and 5 and lower marks in 2 and 3 were at risk of failing the test.

A breakdown of the four standards illustrated that the mean score for standard 2 was considerably lower than those for standards 1, 3 and 5 (see Figure 2). The standard deviation was comparatively wider than in the other three standards tested by the ILT, suggesting considerable diversity in students' understanding of issues related to the criterion 'Accesses needed information effectively and efficiently'. This would support the findings of Bent and Brabazon, who have both highlighted the reluctance of students to use

academic subscription material, preferring generic search engines such as Google.[19] The danger is that students use generic search engines for convenience at the expense of peer-reviewed material from official academic sources. As a result, they lack the ability to access information efficiently and effectively.

By far the most frequently occurring comment from the feedback questionnaire was about the length of the ILT. Students complained of difficulties in maintaining focus and suggested a reduction in the number of questions and a test duration of between 30 and 45 minutes. This was also highlighted by Walsh, who stated that the lengthy and detailed ILT was a reflection of the IL standards stipulated by the ACRL.[20] Walsh continued by stating that, despite the length of tests such as the ILT, MCQ-style assessments are still an attractive option for academic and library staff due to limitations on time and money.

A possible explanation for the lower mean score achieved for standard 5 could be differences in British and American legal issues (such as issues concerning copyright). This was supported by the research team's concerns regarding the applicability of the question content. This could also potentially have broader implications across the other standards (for example, preferred referencing styles).

Although Cameron et al. reported acceptable reliability and validity for the ILT,[21] the present study would question not only the length of the test but more specifically the use of US-orientated terminology. It would perhaps be more beneficial to tailor a similar IL test for students studying in UK institutions of higher education. Whilst the ILT was based on standards developed through the ACRL, a similar test based on the framework of the 'seven pillars of information literacy' model would perhaps be more aligned with UK universities.[22] The 'seven pillars' framework is broken down into the areas laid out in Table 2. The framework provides progression from basic skills such as the 'Ability to recognise a need for information', to more sophisticated skill sets like the 'ability to synthesise and build upon existing information, contributing to the creation of new knowledge'.

Table 2. The SCONUL 'seven pillars of information literacy' framework[23]

Categories	Description
1	The ability to recognise a need for information
2	The ability to distinguish ways in which the information 'gap' may be addressed
3	The ability to construct strategies for locating information
4	The ability to locate and access information
5	The ability to compare and evaluate information obtained from different sources
6	The ability to organise, apply and communicate information to others in ways appropriate
7	The ability to synthesise and build upon existing information, contributing to the creation of new knowledge

Future developments

To develop the work of the ILT evaluation, the SSU team intends to formulate an online MCQ IL skills test based on the 'seven pillars of information literacy' model. This will enable the test to align itself with the framework adopted by other higher education institutions in the UK. Once the test has been assessed for validity and reliability, the intention is to integrate it into the existing IL skills provision and teaching curricula in a bespoke format for courses at SSU. All incoming level-4 students will complete the test prior to the commencement of period 1 and then again periodically (perhaps annually) throughout the course of their degree programme. By committing to such a programme of IL screening, underperforming students will be identified earlier, thus prompting tailored support programmes. It is hoped that with the combined expertise of library and academic staff this mode of formative assessment will promote high academic standards.

Conclusion

As the information network accelerates and develops in complexity, the role of IL skills will only increase in importance. Even though the opportunity to gather pre- and post-data from the ILT was not possible, the project provided a valuable insight into the theory and application of IL-based tests. The next stage is to develop an IL test site (or sites) that will be bespoke for SSU's degree programmes.

References

1. S. Andretta, 'Information literacy: empowering the learner "against all odds"', in Librarians' Information Literacy annual conference, 'Information literacy and e-learning', London, 4–6 April 2005, LILAC: London, 2005

2. M. Bent and E. Stockdale, 'Integrating information literacy as a habit of learning - assessing the impact of a golden thread of IL in the curriculum' *Journal of Information Literacy*, 3 (1), 2009 pp 43-57

3. B. Johnston and S. Webber, 'Information literacy in higher education: a review and case study', *Studies in higher education*, 28 (3), 2003, pp 335–52

4. SCONUL, *Information literacy* (online), 1999, available at http://www.sconul.ac.uk/groups/information_literacy/seven_pillars.html [accessed 2 April 2010]

5. M. Bent and E. Stockdale, op. cit. p. 52

6. A. Walsh, 'Information literacy assessment: where do we start?', *Journal of librarianship and information science*, 41 (1), 2009, pp 19–28, and C.J. Radcliff, M.L. Jensen, J.A. Salem Jr, K.J. Burhanna and J.A. Gedeon, *A practical guide to information literacy assessment for academic librarians*, London: Libraries Unlimited, 2007

7. M. Bent and E. Stockdale, op. cit. p. 44

8. J.W. DaCosta, 'Is there an information literacy skills gap to be bridged? An examination of faculty perceptions and activities relating to information literacy in the United States and England', *College & research libraries*, 7 (3), 2010, pp 203–22, and K. Dunn, 'Assessing information literacy skills in the California State University: a progress report', *The journal of academic librarianship*, 28 (1), 2002, pp 26–35

9. A. Walsh, op. cit

10. B. Johnston and S. Webber, op. cit.

11. L. Cameron, S.L. Wise and S. Lottridge, 'The development and validation of the information literacy test', *College & research libraries*, 6 (3), 2007, pp 229–37

12. Ibid.

13   J. Griffiths and B. Glass, 'Understanding the information literacy levels of students: results of a three year online information literacy audit at Manchester Metropolitan University', (online), 2010, available at http://www.lilacconference.com/dw/programme/parallel_sessions_detail_3.html [accessed 21 April 2010]

14   Association of College and Research Libraries (ACRL), 'Information literacy competency standards for higher education' (online), 2000; available at http://www.ala.org/ala/mgrps/divs/acrl/standards/standards.pdf [accessed 2 April 2010]

15   SCONUL, op. cit.

16   S. Andretta, op. cit.

17   L. Cameron, S.L. Wise and S. Lottridge, op. cit.

18   S.L. Wise, L. Cameron, S.T. Yang and S.L. Davis, *The information literacy test (ILT): the manual* (online), 2009; available at http://www.madisonassessment.com/uploads/ILT%20Test%20Manual%202010.pdf [accessed 5 January 2010]

19   M. Bent and E. Stockdale, op. cit. and T. Brabazon, *The University of Google: education in the (post) information age*, Aldershot: Ashgate, 2007.

20   A. Walsh, op. cit

21   L. Cameron, S.L. Wise and S. Lottridge, op. cit.

22   SCONUL, op. cit.

23   B. Johnston and S. Webber, op. cit.