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Integrating Information Literacy into Curriculum Assessment Practice: An Informatics Case Study

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Abstract

This article describes how an Informatics subject has integrated information literacy skills into its curriculum assessment practice. The paper provides a background on the role information literacies have in student learning and explains the importance of ensuring the literacies are aligned with subject content and assessment practice. It describes the results of an informatics subject that has been developed through collaboration between Academic and Faculty Librarian.

Introduction to assessment practice

As we strive toward the goal of helping students acquire highly developed graduate attributes we need to create assessment tools and strategies that access, define or measure the extent of these learning outcomes. Assessment is in itself a teaching method (Nulty, 2003). Assessment of information literacy promotes learning, provides a yardstick to measure teaching performance and outcomes, highlights learning gaps, promotes the need for in depth structure for learning, can provide opportunities for student and teacher discourse on the topic of information literacy needs or difficulties and provides a foundation for teaching evaluation and certification (Lupton, 2004). This article explores the extent of our effectiveness in these areas.

James and McInnis (2001) identified a number of factors that influence student assessment in Australian higher education, including the prominence of generic skills and the changing nature of the students themselves. The University of Wollongong Review of Assessment Practices and Processes Report (RAPP) (UOW, 2002) found that increased class sizes, increased internationalisation and increasingly diverse student entry backgrounds is necessitating a rethink of teaching and assessment practices. These phenomena are all reflected in the makeup of this case study group.

IACT201 Information Technology and Citizens' Rights, is a compulsory subject offered by the School of Information Technology and Computer Science at the University of Wollongong. The subject caters for approximately 300 students at both undergraduate and postgraduate levels. We attempted to integrate an information literacy structure where learning is embedded within the discipline specific subject curriculum promoting the 'interdependence of information, technology and academic literacy' (Hart, McCarthy & Peacock, 2003). This was of major importance as many of these students come from diverse backgrounds. They included many international students and for some postgraduate students, this subject was their first experience of study in Australia.

Information Literacy at the University of Wollongong

The common theme for both the integration and assessment of Information Literacy learning is that there needs to be close collaboration between all educators (Candy, Crebert & O'Leary, 1994; Bruce, 1995; Iannuzzi, 1998; Wright & McGurk (2000); Lupton, 2004; Colvin & Keene, 2004; Thaxton, Faccioli & Mosby, 2004). In this instance, collaboration has involved, the Subject Coordinator, Tutors, Faculty Librarian and Lecturers from the Learning Development Centre. Collaboration works well when there is acknowledgement of the academic's in-depth subject knowledge, the librarian's information literacy competencies and their combined teaching experience and knowledge of the problems students' experience.

The Council of Australian University Librarians (CAUL) (2001) defines information literacy as the ability to define, locate, access, evaluate and use information in an ethical and socially responsible manner as part of a lifelong learning strategy. Tertiary literacy is defined in the University of Wollongong's *Tertiary Literacy Policy and Procedures* as consisting of academic literacy, information literacy, computer literacy, statistical literacy and professional practices. These literacies in turn refer to the detailed levels of knowledge and skills that lead to the development of the University of Wollongong Graduate Attributes. The integration of tertiary literacy skills into curricula is a priority of the *University's Learning and Teaching Strategic Plan 1997-2005* and is seen as a collaboration between faculty academics, educational development lectures, learning development lecturers, librarians, career practitioners and administrators.

The University Library is recognised for its groundbreaking work in the field of information literacy in Australia (Lipu, 2004, p.50). It was one of the first to endorse an Information Literacy Policy and develop and implement the Information Literacy Introductory Program (ILIP), a compulsory, non-credit point information literacy subject for all undergraduate students (Wright & McGurk, 2000). Faculty Librarians work in close collaboration with academic staff to integrate information literacy into their subjects by providing information literacy instruction and support. Fostering information literacy is seen as the Library's central role.

Integrating Assessment and Information Literacy in IACT201

The large class size and increasing diversity of students in IACT201 necessitated helping students make the critical connection between understanding content and developing academic skills (Bruce & Candy, 1995). Information Technology students tend to consider themselves, highly computer literate but fail to recognise that they are information illiterate and assume that they can intuitively discover how to use the systems unassisted (Emmons & Martin, 2002; Flaspohler, 2003).

Until 2003, information literacy activities had been presented separate to the subject material. In theory this appeared to be a useful mechanism for students to separate content from skill acquisition, however information literacy activities were regarded by students as unimportant. Student feedback in 2002 suggested that the information literacy activities be integrated into the subject in a more 'invisible' manner. In order to address these issues, a workbook model was adopted to bring together the integration of information literacy skills and subject content which included; lecture material, tutorial activities that comprised of readings, class exercises and information literacy activities. This provided an integrated model which gave students greater flow and direction as they worked through the subject. This holistic approach was welcomed by students whose feedback included;

> *"The implementation of the tutorial workbook was a welcome addition. It added a more organised and comprehensive structure"*

Information literacy activities focused on three major areas: research and evaluation of research sources with fair and accurate referencing; critical thinking and essay writing. Students learnt not just to cut and paste but to critique, analyse, evaluate and modify their writing to continually develop their skills and knowledge. Students identified the value of this approach in feedback;

> *"Good skills-development exercises for academic research and writing"*

The changed assessment was documented as a best practice example of Graduate Attribute 5 *"ability to logically analyse issues, consider different options and view points and implement decisions*". This formed part of a project funded by a 2003 Collaborative Grant from the University of Wollongong Educational Strategies Development Fund, 'Developing the Attributes of a Wollongong Graduate'

(http://www.uow.edu.au/about/teaching/attributes/informatics/attribute5.html).

Assessment

Assessment should help students to learn and be consistent with subject objectives which reflect an emphasis on building information literacy skills (CSHE, 2002a; Flaspohler, 2003). Assessment and subject content particularly in an Informatics subject need to reflect changing technologies and world views to be relevant to today's students and their diverse backgrounds (UOW, 2002).

In 2002, the first phase of a subject review was undertaken to align assessment and information literacy components. In consultation with Learning Development Lecturers and the Faculty Librarian, information literacy activities were integrated into the assessment tasks. This was further expanded in 2004 to include lecture content, assessment quizzes and comprehensive tutorial activities that involve student interaction with information literacy activities. This variety of assessment tasks enabled the assessment of learning at varying levels and promoted a wider experience of both generic and discipline-specific skills (Lupton, 2004).

Markless, Streatfield and Baker (1992) and Wright & McGurk (2000) believe that students are more convinced of the value of information literacy skills when they are articulated in the classroom. All information literacy presentations were delivered in the context of the topic being studied and focused on the approaching assignment question. Summative assessment where marks contribute to final grades (Nulty, 2003) helped to provide a focus for the student and gave credence to the information literacy components. See the essay marking criteria in Appendix 1.

Library presentations within lectures were scheduled to strategically align with assignment preparation dates as shown in Figure 1. Time of need instruction is one of the principles of successful information literacy development (Nimon, 2001). These lectures were audio taped for delivery to the South Coast Campus students. Copies of the Power Point presentations were loaded onto the University's Online Learning platform, WebCT. The Shoalhaven Campus Librarian offered the local students short library tutorials mirroring the main campus lecture presentations.

Information Literacy Session 1	***Learning Activity 1***	***Assessment Task 1***
The Faculty Librarian introduced library services, online guides to finding information and online resources related to finding journal articles and referencing. Detailed instruction on database searching focused on Essay 1.	Activities included writing an annotated bibliography and completing a number of multiple-choice questions in an online quiz to reinforce the lecture content.	Essay 1 required students to focus on using scholarly journals to support their arguments in the essay. The marking criteria recognised the inclusion of a variety of academic sources.
Information Literacy Session 2	***Learning Activity 2***	***Assessment Task 2***
The Faculty Librarian introduced a database of e-books. This lecture focussed on the need to use a variety of sources for a business-focused assignment.	Activities included; comparing sources from the e-book database with traditional scholarly works, providing evidence of a successful search with a correctly cited e-book reference and another online quiz.	The Group assignment required students to develop a 'real-world' application. The marking criteria required references to industry sources.

Figure 1: Information Literacy Structure in Curriculum Assessment Practice – IACT201

Library services, especially online guides to finding information, generic library workshops, online tutorials, database guides and the *Information Technology Resources by Subject* webpage were presented. URL's to the resources shown were included in the student's workbook. Veldof & Beavers (2001) extol the usefulness of online tutorials to support faculty in integrating information literacy into their curricula.

Multiple choice quizzes and activities were developed collaboratively to reinforce the training and develop familiarity with the resources. Bruce & Candy (1995), Crebert & O'Leary (1995); Nimon (2001) and Flaspohler (2003) all cite the need for repeated opportunities to reinforce learning. Library activities included; writing annotated bibliographies using academic journal articles from the resources demonstrated and the inclusion of printouts showing search strategies. These small assessment tasks also attracted marks and were due the following week.

A challenge in IACT201 is the setting of assessment tasks that take into account:

- catering for a diverse student population
- catering for large classes
- ensuring consistency across delivery (off-campus sites and multiple tutors)
- increased relevancy and effectiveness of assessment tasks
- Integrated subject and skill-based exercises

The assessment tasks were designed to synthesise major concepts and skills learned throughout the subject. The assessment criteria for the essays was designed to encourage the students to practice their information literacy skills and be rewarded for their efforts (Wallace et al., 1999, p.139). To meet the challenges of assessment for the large class, clear assessment criteria were communicated to students and tutors in the form of Assessment Sheets (see Appendix 1) together with the key to ratings, clearly setting out what was being assessed and how marks would be assigned. The importance of this process is outlined in the Centre for the Study of Higher Education report on Assessing Large Classes (CSHE, 2002b). For each assessment task, students knew the criteria they would be assessed on prior to commencing the work.

Formative evaluation was provided by the tutors on the assessment sheet. In the lecture, summary statistics were shown to allow students to gauge their performance across the enrolment. Students also participated in guided reflection activities in tutorials giving them the opportunity to reflect on this formative evaluation and identify areas for improvement. This type of formative assessment provides valuable feedback to enable students to progress and learn through experience (Nulty, 2003). For most students this was an opportunity to see the importance of correct referencing, writing structure and flow of ideas.

By the time students submitted the second essay they had participated in further reflection sessions where they brought skeleton essays to class in order to test ideas and further develop arguments from group feedback. This reinforcement and improved familiarisation with information literacy skills was reflected in the higher average mark in the second essay. Students were more confident in their approach to the task and displayed increased competency in their ability to find suitable information. Feedback confirms the increased confidence of students;

> *"The workbook was good – it taught us some of the things that we're already supposed to know even though no-one else does it"*

Analysis of results

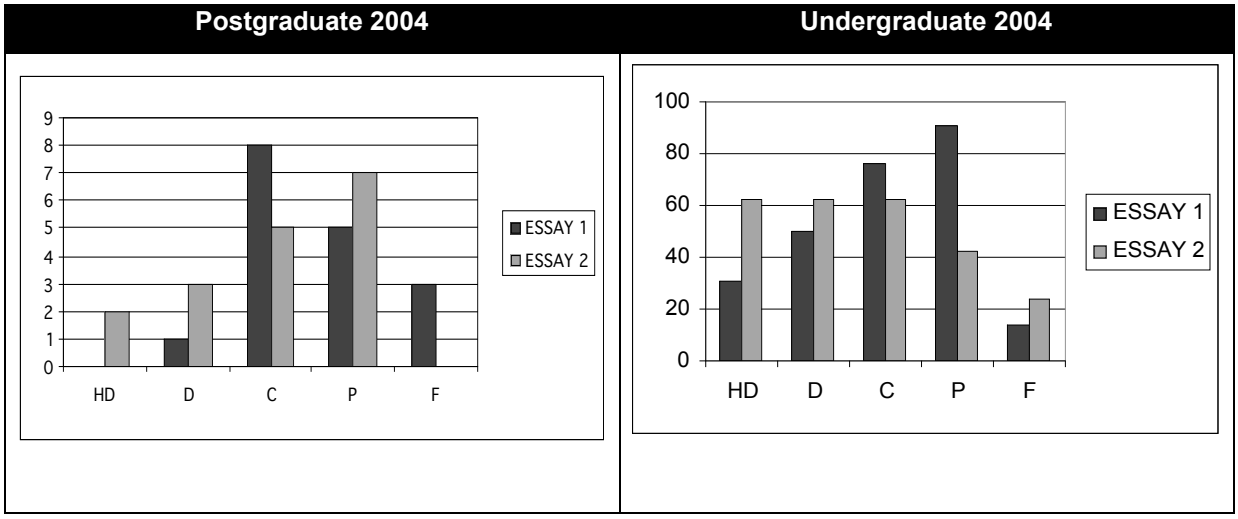

Figure 2: Comparison of essay results

The literature universally acclaims the inherent difficulties of assessing improvements in information literacy however Barclay (cited in Flaspohler, 2003) maintains that 'some hard evaluation data, even if the data may be less than perfect, are better than either no data at all or soft data obtained from anecdotal observation and surveys of student satisfaction'.

Figure 2 represents the spread of marks between essay 1 and 2 in 2004. The average mark for the essays improved from 68% in essay 1 to 73% in essay 2 for the undergraduate intake. The average mark improved from 58% to 67.5% for the postgraduate student group. This seems to indicate that students from non-English speaking backgrounds especially benefited from the information literacy component of the subject. This group mostly comprised newly arrived international students. The subject content was designed to help these students adjust to the new expectations of higher education practice in Australia and possibly unfamiliar assessment practices as detailed in the Centre for the Study of Higher Education report (CSHE, 2002c). The explicit marking criteria and practice exercises enabled students to develop familiarity before summative assessment submission.

Students showed an attempt to use scholarly journals in essay 1, but most restricted their searching to one online database, with most support for the essay arguments coming from one source. The formative evaluation focused on these issues. It also became a target issue for essay 2 where a marked improvement was seen.

Figure 3 shows a trend to a higher average overall grade in the subject. This figure consolidates the results for both the undergraduate and postgraduate groups. In 2003 32% of students received a Distinction or High Distinction. This increased to 46% in 2004. We believe that this is a reflection of the success of integrating information literacy into the student learning experience.

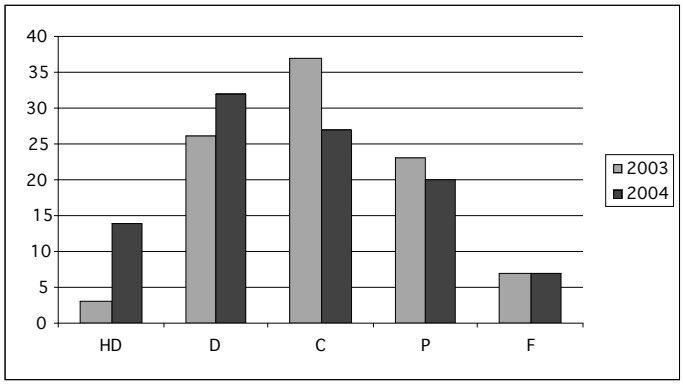

Figure 3: Final grade comparison

Conclusion

The integration of Information Literacy instruction into the IACT201 program appears to have made a significant improvement to the grades of both undergraduate and postgraduate student groups and ensured progressive development of increasingly sophisticated information skills (Bruce & Candy, 1995). The case study results support information literacy principles that collaboration of library and academic staff, the time of need integration of information literacy training into the curriculum and linking it with the assessment process ensures successful outcomes (Colvin & Keene, 2004). This experience has provided us with a wider perspective and the benefits of collaborative energy (Thaxton, Faccioli & Mosby, 2004, p.185). It is hoped that ongoing collaboration will enable the adoption and integration of information literacy across the whole faculty so that skills can continue to be developed to higher levels as students move through the course (Wallace et al, 1999 p.137).

Just as the quality framework focuses on the need to constantly review and improve all processes, we have already identified areas to target in 2005. We will strengthen the relationship between information literacy and assessment in lecture material, associated assessment tasks and the assessment criteria. User feedback is essential (Veldof & Beavers 2001) as a measure of student satisfaction as well as success. Fox, Richter and White (1996) believe that evaluation is best if focused on both formal measurement and informal feedback. From feedback received, we believe that the integration of assessment and information literacy into IACT201 curriculum assessment has been successful.

> *"[There was] excellent inclusion of relevant…and effective workbook exercises"*
>
> *"The workbook I think was a good idea. It clearly helps students understand basic writing formats. The work we do on essay and report writing…is priceless"*

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Appendix 1

University of Wollongong Australia

Student Number _____

Essay Assessment Sheet

	0	1	2	3	4
USE OF SOURCE MATERIAL					
Relevant material selected					
Accurate and smooth integration of material into the answer					
Free of irrelevant material					
Free of plagiarism (with correct acknowledgement of sources)					
Consistent referencing system used					
STRUCTURE AND DEVELOPMENT OF THE ANSWER					
Focussed position statement in introduction					
Key issues identified and discussed					
Logical development of argument					
Explicit on question throughout					
Appropriate statement of conclusion which reiterates the main line of argument in discussion					
Structure of the text appropriate to the task					
Legitimate paragraphing that is used to develop the argument					
Critical evaluation of evidence					
GRAMMATICAL CORRECTNESS					
Grammatical structure which follows recognizable and appropriate patterns of English					
Punctuation which correctly conveys meaning and sentence structure					
Length					
Correct Spelling					
PRESENTATION					

MARK /15	% MARK	MARKER

COMMENTS

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Key to Rating

	0	1	2	3	4
Use of source material	Limited sources: high degree of paraphrasing	Uncritical discussion or assessment of sources: writing close to sources	Some evidence of critical analysis	Critical analysis of sources	Highly developed critical analysis and assessment of difference approaches
Structure and development of the answer	No demonstrated understanding of question, not all issues raised by the question have been answered: maybe inaccuracies and irrelevant material	Borderline understanding of question: may not have answered all the issues which the question raises: lacks comprehensiveness: maybe some inaccuracies	Sufficient understanding of question: answers all parts of question: lacks comprehensiveness: maybe minor inaccuracies	Good understanding of question: answers all parts of question but not as comprehensive. Distinguishes between main and secondary arguments	Unequivocal understanding of question: answers all its parts comprehensively and accurately. Main and secondary arguments defended against rival explanations
	No idea of structure	Some evidence of structure: intro, body, conclusion	Clear evidence of structure: but internal problems in structure still evident	Clear structure: well constructed essay	Essay structured to emphasise argument, clear intro and conclusion, logical presentation of argument
Grammatical correctneses	Gross spelling, grammatical errors, poor syntax. Does not conform to word limit	Basic understanding of rules of grammar and syntax: sentence and paragraphs: no spelling errors	Some evidence of fluency in writing, no obvious errors in grammar or syntax	Clear and fluent writing	Well constructed and crafted piece of work: a pleasure to read
Presentation	Poorly presented: does not conform to standard Incorrect documentation of sources	Average Presentation: all required information included. Consistent referencing of sources	Well presented. Consistent and appropriate referencing of sources	Very good presentation.	Excellent Presentation

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