

Information Literacy - Implications for Early Childhood Teaching

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Information literacy encompasses both technological skills and skills to locate, evaluate, and use information from a range of sources. Early childhood teachers require knowledge, skill and confidence in such skills to inform their teaching practice and to facilitate their ongoing professional development. Increasingly, within early childhood programs, there is a focus on the development of information literacy skills of children from the time they enter formal school programs and this continues across their schooling years. Cohorts of students in a Bachelor of Education course, completed surveys in which skills levels and knowledge of information literacy were explored. Students were found to have a range of skills and confidence levels and they indicated commitment to such skill development. The importance of a focus on early childhood students' skills in information literacy are discussed in terms of the need for systematic planning and integration of a range of information literacy tasks across students' undergraduate programs. The implications that such experiences have for teachers' professional practice, as educational contexts change and increasing importance is given to children's information literacy skill development, is explored.

Increasing, we are aware of a new communicative order as we face a future dominated by computer technologies. Technoliteracy (Synder, 2000) is largely uncharted territory in early childhood education. In the education of young children, there needs to be greater attention given to understanding the complex connections between literacy, technology and learning. For early childhood teachers to convey to children the value of such literacy, then teachers must be comfortable with using emergent forms of technologies effectively. While modelling to children the value of technology for learning and accessing information, acceptance of rapid change in technological systems can also be conveyed. However, most importantly, the technologies have the potential to enable teachers to keep abreast of current knowledge and to solve problems through access to a breadth of information which can be evaluated for its worth in making classroom decisions.

A socio-cultural view of technoliteracy (Lankshear, Snyder & Green, 2000) gives an understanding the fit between technology and information literacy. It encompasses three dimensions: an operational dimension (the ability to use new language systems and operate the technology); a cultural dimension (ability to use the operational systems to accomplish real tasks in the context of school, work or everyday life and participate freely in the associated cultures); and a critical dimension (abilities to evaluate, assess and critique the technology and its resources and the information it provides).

For children and teachers becoming information literate is an important goal. Information literacy (Association of College & Research Libraries, 2000) is about the recognition of the nature and extent of the information needed to accomplish a task; abilities to access

information effectively and efficiently; the critical evaluation of information and its sources in order to expand, reframe or create new knowledge; the management of information and its dissemination; cultural, social and legal issues on the use and access to information; as well as a commitment to lifelong learning. Because information literacy is perceived as an important characteristic of lifelong learners, it is an important aspect of undergraduate education (Candy, Crebert & O'Leary, 1994). However, as Bruce (1998) noted, there is considerable rhetoric but comparatively little guidance for educators in how to promote information literacy skills within tertiary courses. If universities wish to graduate information literate students in a climate of rapid technological change, then more attention needs to be given to how such skills are effectively developed.

While information literacy skills are usually considered in relation to the use of information technology, such technology does not, in itself, provide a mean for developing other important skills related to information literacy. Information literacy involves specific behavioural skills (e.g., using technology) but also processes of critical evaluation of information. While information technology provides students with opportunities to gain access to a wide range of information that can be the catalyst for more critical thinking, a critical perspective is unlikely to develop unless opportunities are provided to support students in being able to evaluate information. This latter skill will be developed when the information to be evaluated is meaningful and relevant, related to the specific academic curricula in which students are engaged.

Mapping competencies in information literacy

Staff within the School of Early Childhood and at the QUT Library have become engaged with both mapping and supporting the development of information literacy skills in a systematic way, for students in the Bachelor of Education (Early Childhood). The mapping includes understanding students' use of technologies as well as their skills to retrieve and use information from a range of sources. It is considered that specific information literacy tasks set within specific subjects will enhance the development and meaningfulness of competencies. This paper reports these efforts to map and develop students' information literacy skills.

Three hundred and eighty-seven students in their first, second and third years of study completed a survey focussed on their competence in the use of various information sources. Students also were asked to comment on learning needs. Of the 387 respondents to the survey, 98% (378) were female. The mean age was 22 years; and the modal and median age was 20 years. Eighty-five percent of the students were under 26 years. Thirty percent (116) were first year students; 38% (147) were second year students; and 32% (124) were third year students. Eighty-eight percent (249) of the students reported that they had access to computers at home; 87% (245) used an email system and accessed the Internet, primarily through the QUT system. Eighty-six percent (330) reported that they were either very competent or could use a word processing program well.

Self-reported competence in information retrieval tasks

In this paper, data is reported on students' ratings of their level of competence on a number of information retrieval tasks - skills in using the QUT on-line library catalogue; using the library indexing system to retrieve materials; using bibliographic databases, including ERIC and E*Subscribe; using search engines on the Internet to locate information. Students rated their competence on a 5-point scale (scale descriptors - I have not tried this; I have tried without success; I am a beginner; I can do this well; I am very competent). Valid and complete data on the various questions reported from the survey in this paper were available for 371 students.

In Table 1, results are reported for the percentages of students at each of the year levels who reported higher levels of competence (I can do this well; I am very competent) on various questions. Differences in reported levels of competence were also tested between all responses categories at the various year levels using Chi-square. Significance differences are indicated in the table. As could be expected there were significant differences between year levels in the level of competence reported. This is illustrated in Table 1 by the increased percentages. Significant differences were found between first year students and second and third year students in the ratings of competency.

Table 1 Information Retrieval Tasks: Percentage of students reporting - *I can do this task well or I am very competent*

Question	1st year students (116)	2nd year students (147)	3rd year students (107)
I can use the QUT on-line library catalogue. ($p = .000$)	38%	81%	99%
I can use the indexing system to locate books and journals. ($p = .000$)	35%	70%	87%
I can use bibliographic databases to locate relevant journal articles and reports. ($p = .000$)	12%	23%	77%
I can use search engines on the Internet to find current information on specific subjects. ($p = .022$)	64%	92%	77%
I can retrieve ERIC documents using the microfiche and E*Subscribe. ($p = .000$)	2%	17%	35%

The issue of interest is: How do students learn these skills? Across the course there are increased expectations that students have obtained these skills in order that can complete assignment work. Greater experience in the course, in general, leads to increased competence. However, this does not mean that students have been explicitly taught specific skills and/or that they believe that they are able to accomplish these tasks with effectiveness and efficiency. As students reported in an open-ended question on their learning needs in relation to information retrieval skills, they recognise the need for the ongoing development of skills.

Students' perceived learning needs

Students were asked to respond to the question: *What knowledge and skills are you interested in developing to be successful in locating and retrieving information from a range of sources?*

As indicated, in the above table, there was a developmental progression across year levels in reported competence. Student responses to the open-ended question also indicated differences across year levels in their learning needs.

First year students

First students indicated willingness to learn and a desire for competence to ensure success in their studies:

- I would like to be able to use a variety of information sources competently;
- Use the Internet effectively and learn how to use other systems to my advantage;
- As much as I can, on a need to know basis because whilst it is essential, it is a means to an end;
- I want to be able to use all the library's resources and to use them well and with confidence;
- To be able to use these resources effectively to aid my studies.

Second years

Second year students saw greater challenges than the first year students in developing their information literacy skills. Issues of time pressures emerged and there was more focus on the need for practice and efficiency:

- I want complete access to and control over all aspects of the new technologies;
- I would like to be confident at doing this and be able to be effective and efficient in my searches;
- To be able to DO it! And do it easily, quickly and successfully;
- I am just beginning to find my way around all the sources of information;
- To be a competent/confident and efficient user (especially in searching for information through various sources).
- More practice and sufficient time allocation!
- I would like to keep up to date with current systems.

Third years

The themes from third year students also indicated the importance of keeping up-to-date and in refining skills; but also there was a greater sense of the need to be more selective and to be able to evaluate information than was evident in the comments from first and second year students:

- When Internet searching, it's hard to separate the jargon from worthwhile things. I'd like to know how to get more specific information in a shorter time frame;
- I'd like to become more competent with using the databases. I guess its just practise to be more competent;

- I need to develop more confidence - there is not enough time to just practise and explore the databases, the Internet etc. (due to assignments, family commitments)
- Frustrating not knowing what keywords etc to put in when conducting a database search. I often seem to get irrelevant data!
- Time to explore and experiment. How to do a more precise search on the Internet for information that I need.
- I could learn more about refining web searches; the most useful search engines for particular topics; and knowing how to find reputable journals that can be downloaded in full.
- There is room for improvement in all areas. I can find my way around but I'm not very competent and sometimes I know there must be a quicker way.

Embedding information literacy tasks in units

1999

In 1999, I (Donna) with a teaching partner chose to embed two information literacy tasks within a subject in which we were both teaching for the first time. The tasks presented as part of assessment were: (1) to access and search electronic databases; and (2) to browse and evaluate Internet sites. Students were required to complete two assessment tasks. While the tasks were quite narrowly defined, the intended outcomes of the tasks within the subject were more broadly conceived to: improve the quality of learning of the content of the subject and to ensure that all students had a base level of skills to search and retrieve information from electronic databases and the Internet in relation to the subject area; critically evaluate information and communicate such information effectively; and to use technology to post information to the larger student group in an on-line discussion group. In the final lecture of the subject, students completed an evaluation of the tasks. The details of the tasks and the evaluation comments are described in the following sections.

Task 1 - Using databases to access current journal articles on a selected topic

Students were required to select a topic focussed on a particular area of developmental or educational special needs of young children and conduct an online search for current journal information on the topic, using one or more electronic databases. Students documented their search process and this documentation was submitted to the lecturer as part of the assessment. Students selected one journal article, which from the abstract on the database, they considered would contain useful information on the selected topic.

Evaluation question: *Did this task increase your skill in database searching and the evaluation of database information?* On the evaluation questionnaire, 83 % (45) of the students responded that the assessment task contributed to their skill development to search databases and evaluate information. Comments from those who indicated that the task was of value included:

- It gave me confidence to use databases as I have never used them before.
- I have done searches before, but it reinforced my abilities to use databases.
- I had never really used databases before because I didn't know how. Now I use them a lot for other subjects.

For those students (17%, 9) who indicated that they did not find the task useful, their comments related to their level of previous experience (e.g., I already knew how to search databases and assess information for its value to me). While a proportion of students were able to use electronic databases, there is a need to ensure that all students develop the

skills to use this important information source so as to be able to access scholarly and current research information in a discipline area.

Task 2 - Using the Internet to access resource information

The second task required students to use the Internet to locate three sites on topics related to a specific area of special need for young children and to evaluate the sites for their usefulness to early childhood teachers in programming for young children. Students were required to write a short evaluation of each site and submit these evaluations electronically to the online class discussion group. Similar criteria as in Task 1 were used for assessment of the site evaluations as satisfactory.

Evaluation question: *Did this task increase your skill in searching the Internet and evaluating Internet information?* With respect to the Internet task, 61% (33) of students reported that they thought it had value. Illustrative comments related most specifically to how they could now evaluate Internet sites:

- It didn't increase my skill in searching but I was able to evaluate the Internet information more easily with the handouts on evaluation.
- Although I knew how to search the Internet, I was never really confident about choosing appropriate trustworthy sites.
- I became familiar with different search engines and have come to realise from the evaluations that many Internet sites are just commercial advertisements or personal reflections.

The comments of students (37%, 20) who indicated that they did not find the task useful indicated that they were already competent in doing Internet searches. While we did not believe that we were doing anything unique in these tasks the students responses on Task 2, across the board, provided information that most students are using the Internet regularly as an information source in their studies but that they may well require more direction on how to evaluate the information that they obtain.

2000

Further development of these tasks was made in 2000. Skill development workshops in the computer lab were voluntary workshops rather than being an essential part of the tutorial program. The increased availability of full-text databases had occurred across 1999-2000 and students were encouraged to experiment with these. As well as the increased availability of on-line full-text databases, there was a sense by the lecturing staff that students were more at ease with the requirements of the tasks than a year previously; indicating the pace of change in technology and informational sources then was available to the previous cohort of students in 1999, indicating a need by students and staff to keep abreast of new developments. Expectations about students' skills to evaluate Internet sites were raised, and students were guided to a number of resources to increase their skills in this area.

These ongoing systematic efforts to develop information literacy tasks within the academic curriculum are believed to be very important. As information systems develop and evolve it is vital for tertiary educators to keep abreast of these changes. There are many implications for how the education of early childhood teachers needs to take into account the development of students' skills in using technology, in understanding new forms of literacy, as well as the value of new systems for accessing information that can inform practice.

Directions for information literacy education

Bruce (1998) proposed a relational approach to information literacy. A framework that emphasised not just skills acquisition but the growth of learners as they come to understand and experience information literacy in different ways. Information literacy is an ongoing process in a world of technological change but also it is progressive as skills develop across time, with practice and experience in using specific information sources. This leads to a personal style of how and where to seek information and personal heuristics for searching for information effectively and efficiently. High levels of skill contribute to better evaluation of information that can enhance decision-making and problem-solving.

Tertiary educators need to develop a deeper understanding of information literacy education - to evaluate existing curricula on its contribution to the development of information literacy skills and to devise new teaching practices. Bruce (1998) argues for the need for greater clarity on outcomes from information literacy educational practices. A systematic approach to understanding and incorporating information literacy skill development in undergraduate courses needs to be adopted within undergraduate courses. This applies to early childhood teacher education courses as much to other levels of education in order to ensure that children have teachers appreciate the importance of information literacy and who can provide competent and confident models in the use of technology to seek information on real world problems, as well as to evaluate such information critically.

We have a range of ideas on how we can guide students' development of skills. In a changing educational and technological environments there are still many ongoing issues. Two important questions are:

- As students develop skills to access information using technology, how can we encourage them to appreciate the importance of relevant information for effective problem-solving? We surmise that such outcomes require confidence to use the technology, at which point, more attention can be given to the evaluation of the quality of information to use in decision-making and problem-solving.
- How can we ensure that students learn to understand and appreciate information literacy in new ways across subjects within undergraduate courses? Greater staff communication is needed in order that there are planned and systematic approaches to ensure students' information literacy competencies.

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