

# Information Literacy Education for PhD-Students – a Case Study

Paper presented at NORD I&D, 12th Nordic Conference on  
Information and Documentation  
Aalborg, September 1-3, 2004

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**Log-skrivning kan være et nyttigt redskab ved informations-søgning. Det viser et undervisningsforløb for phd-studerende ved Skövde Universitet.**

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## Abstract

A credit bearing course aimed at PhD students within the area of computer science was given at Skövde University during the spring semester of 2003. One of the key aims of the course was to encourage students to develop their own concepts of information literacy and to reflect on their information management process. In order to achieve this, emphasis was placed upon studying and discussing the theories of information literacy, and the students were required to write about and record as much as possible of their experiences around their information work. The course syllabus required the students to write several critical accounts of the course literature and to concurrently maintain a log describing the work that the main task involved, which was an information seeking and management assignment. The critical accounts and the course evaluations together with the teacher's (author's) experiences provide the basis for the discussion presented in this paper.

The course revealed that PhD students have specific needs, which need to be fulfilled to enable them to manage their personal research information satisfactorily. Therefore a generous section of this paper is devoted to this issue. The paper also contains a background to the described case study giving an account, based on the literature, of different ways of conceptualising and thinking about information literacy.

Traditional bibliographic instruction

has had great faith in information resource focused training. The technical procedures in the information search process have often been seen as the most important aspects. The course described here – which is greatly influenced by Christine Bruce's relational model of information literacy – has instead emphasised the more theoretical aspects of information literacy that could be described with a few, for the course very central terms: information use and -behaviour; information assessment; and search processes. Bruce's statement that "learning to be information literate, in this [the relational] model, involves becoming aware of different ways of experiencing information use through engaging in relevant information practices and reflection" (Bruce, 2002) has been seen as the governing idea through the course.

## Introduction – the concept of information literacy

The concept of information literacy has been scrutinized by a number of authors (Mutch, 1997; Bawden, 2001; Båge & Ekelund, 2003) that shows us that there is a wide array of different definitions. Despite the differences most of the various definitions seem to emanate from either ALA's presidential report (1989) or Christine Bruce's model of information literacy (Bruce, 1997a). The ALA definition got refined and developed by Doyle (1994) and represents a behaviouristic view upon information literacy where the

idea of personal attributes plays an important role. Bruce's model is characterized by its relational approach (Bruce, 1997b) where information literacy is explained in the light of context and situation.

According to the author a precise and general definition of the concept of information literacy is impossible to present. But the author's view is also, that a paper that deals with information literacy-related issues should clearly state the author's perception of this central concept. In doing this a few distinguishing features, borrowed from other authors, are pointed out. Johnston and Webber (2002) points out the ability to adopt appropriate information behaviour. Bruce (2002) calls attention to the necessity that "learning to be information literate /---/ involves becoming aware of different ways of experiencing information use through engaging in relevant information practices and reflection". Klaus (2000) states that "the very words – information and literacy – call upon us to be concerned with meaning and interpretation that is inherent in what people do and think. Essentially, information is something that is understood, and literacy is an accomplishment referring to a particular way of understanding something." This way of perceiving the concept of information literacy provides the foundation for the course that is described in this paper.



Something that became apparent during the course was that the process of log-writing enhanced both higher order thinking skills and more structural, down-to-earth, skills such as the ability to organize the collected information in such a way that access and retrieval is enabled.

### The Case

During the spring semester 2003 the course Information literacy for PhD students was given at Skövde University. It was an accredited course (4,5 ECTS) aimed at computer science PhD students where the students were required to work full time for three weeks. Worth mentioning is that all of the 18 students, besides being PhD students, also teach and supervise undergraduate and graduate students.

Since one of the core ideas behind the course was that development of information literacy is enhanced if students are encouraged to develop their own concepts of information literacy, a substantial amount of time was used for reading, discussing and writing about theories regarding information literacy.

The students were also given the opportunity to raise their own questions and issues on the subject so that they could be dealt with during the course. One issue that was of interest for many students was the question about personal research information management. Most of the students were at ease searching for and using information but were less able to cope with the task of organizing and bringing order in their ever increasing amount of gathered information.

Both the students and the teacher had a fairly vague picture of what tool or strategy could be useful for this specific purpose. But the teacher had the idea that increased awareness of the problem was a good starting point and that writing and especially log-writing could be a beneficial tool. This was the background to the idea of making this course in to something of an experiment with the aim to find out if log-writing is a tool that can be used for personal research information ma-

agement and if the writing enhances the development of the concept of information literacy. Another question was in what way PhD student's information related needs are different to other students.

The result of this "experiment" is presented in this paper.

Conscious writing as an enhancing ingredient of information literacy is nothing new:

"Journal writing has been found to be an excellent way to encourage composing, to advance formulation, and to track an individual's constructive process. Counselors may recommend that students keep research journals in which they record ideas, questions, and connections as they progress through their search. Writing in a research journal is much more comprehensive than jotting notes on notecards or in a notebook." (Kuhlthau, 1994)

### PhD Students and Information Management

PhD students can be said to have the same, if not a greater, need to be information literate as any other university student. But there is one information related aspect that seems to be of a greater importance for PhD students: the ability to handle large amounts of research information is of particular importance for this group of students. Their studies are often taking place over a long period of time and they tend to penetrate their subjects thoroughly, hence they are subjected to and collect large amounts of information. The majority of the students participating in the course indicated that it is very important to be able to organize and develop rational ways for easy and quick access to information. The average student claimed to have col-

lected an immense amount of information, between 30 and 50 folders consisting of articles and reference lists<sup>1</sup>.

The area of PhD student's personal research information management has been studied before. Genoni and Partridge (2000) have described the so called "Project PRIM" (Personal Research Information Management) in which students from the field of humanities participated. A conclusion that Genoni and Partridge draw from their study of the PRIM project was that "many students who undertake post-graduate research are poorly prepared for the personal research information management tasks which await them". They also came to the conclusion that there is often "an assumption made by both students and supervisors that having reached the point of enrolling in a research degree, students should already have developed the ability to deal with information gathered during research/---/" and that "even after a period of research many students have not acquired the skills necessary to conceptualise their research data in such a way that it can be efficiently stored and retrieved". Genoni and Partridge also state that "research students have information literacy needs, which are distinct from those of undergraduate students; /---/" and that "access to appropriate software is important, but researchers also require the skills to conceptualise their research data in a way which maximizes the advantages of software." (Genoni & Partridge, 2000, p. 233)

The students that participated in this course turned out to have both a greater experience of and more developed skills in research information management than the students in the PRIM Project. Approximately 50% of the students were experien-

# The results indicate that log-writing can be a valuable tool both for students, and others, when dealing with large amounts of information and where there is a need to gain greater control over information search processes

ced users of bibliographic management software programs – mainly EndNote and BibTeX – before enrolling on the course. They were also well aware of the necessity of being able to retrieve the information they had collected during their studies quickly and easily.

## Methodology

The method that was used is characterized by a qualitative approach where the student's oral and written accounts provide the foundation for the picture that is evolving in this paper. The method is inspired by a practical type of action research that emphasizes researcher participation, has a reflective perspective and intends to both evaluate and improve educational practice and understanding in a specific context. The results will therefore be taken into consideration next time this course is given. Subjectivity is not regarded as a problem; according to Levin & Greenwood (2001) "action research treats the diversity of experience and capacities within the local group as an opportunity for the enrichment of the research/action process." (p.105)

As previously indicated the material used consisted of both the logs and other written accounts produced by the students under the duration of the course and of the continual dialogue between the students and the teacher where great effort was made to provide ongoing oral and written feedback. The teacher also kept a diary throughout the course where observations and experiences of importance were recorded. The forms used to evaluate the course also contributed to the results.

## Results

Towards the end of the course, after six written assignments (including the log), the adoption of continuous and conscious

writing alongside the information searching process proved to be a beneficial and effective tool to aid personal research information management. One of the common problems encountered by many PhD students is the belief that one has control over the amount of information that had been collected only to experience difficulties at a later stage when the information is to be retrieved and placed in context.

To recognize the information work (searching, handling, using) as a coherent process, divided into different intertwined stages, was, for the majority, a new idea. At the end of the course most of the students claimed that the process view facilitates the information work. It was also claimed that the writing – from formulation of specific queries to the continuous recording of search results – is something that increases the level of information literacy.

Even if the guidelines for the log-writing were the same for each student (see appendix) the way in which they dealt with the task varied. A majority followed the guidelines rather exactly, for example the way in which they used the same headings (as in the guidelines) to arrange their texts. Others took greater liberties and worked with dated entries, as in a diary; logging in its true sense. Another alternative comprised of colour coding different paths in the search process depending on status and dignity. Interesting to note is that the logs, as well as the bulk of authentic search processes, often begin at a specific point, where the searcher has a clear view of what she wants to achieve, but ends up somewhere that could not be anticipated. Ambitious preparations often need to be greatly modified and lists of key words are constantly revised. In light of this it is advantageous to have a written record of all the steps and stages in a search process. Almost all the students

agreed on that.

Seen from this papers point of view, where writing and information management is in focus, the sections Reflection and Information management (see appendix) turned out to be the most interesting sections. It's mainly there the students express their opinions about the log-writing and give evidence of the problems that they experience in connection to handling large amounts of information. Many students experience a sense of vague anxiety; a feeling of having missed important paths that could have lead them to essential information.

Concerning the actual log-writing one of the students expressed his experience in this way: (author's translation from Swedish into English)

"I am surprised that I have found so much new material since I have performed so many searches prior to this"

And he continues, pointing out some factors that distinguish this search from his prior searches:

1) "I have had an increased focus in my searches and especially used the 'width-first' technique instead of a 'depth-first' technique. This has been possible because I formulated my research question more specifically this time and because  
2) I have found a new form of documenting the status of my searches, namely this document. I have not been able to do this before, which has led me to loose the thread between the different search sessions. It is so easy when you are sat in front of a search tool to just 'click on' without documenting what you have been doing."

## Discussion

The results from this study, as with most qualitative research, are not intended to be used to draw a general "true" conclusion such as a claim that log-writing should be

a mandatory part of information literacy training. The objective is to present a valid picture of how something is or can be understood in a specific context at a given time and the results indicate that log-writing can be a valuable tool both for students, and others, when dealing with large amounts of information and where there is a need to gain greater control over information search processes.

Something that became apparent during the course was that the process of log-writing enhanced both higher order thinking skills – for example when students express the opinion that log-writing has helped them to understand the information work as a complex process – and more structural, down-to-earth, skills such as the ability to organize the collected information in such a way that access and retrieval

is enabled.

### Conclusion

To take a critical and investigative stance in one's practice (teaching) and through reflection, documentation and communication with the purpose to improve the practice is both stimulating and beneficial – the case described here resulted in increased interest and commitment in the course for both the students and the teacher. The way the students and their teacher were cooperating whilst trying to improve the students research information management could be described, in Levins and Greenwoods words, as "the engagement of the student in a critical and reflective learning process that integrates teachers and students in a joint inquiry process." (Levin & Greenwood, 2001, p. 103) The Author would like to claim that this way of dealing with the teaching

and learning situation is close to an ideal situation; a situation which in many ways is similar to the ambition that is expressed in CAUL's Information literacy standards, in the paragraph about the importance of lifelong learning:

"Developing lifelong learners is central to the mission of higher and other educational institutions/---/. Information literacy extends learning beyond formal classroom settings and supports individuals in self directed learning in all arenas of life. By ensuring that individuals can think critically, and by helping them construct a framework for learning how to learn, educational institutions provide the foundation for continued growth throughout their careers, as well as in their roles as informed citizens and members of communities." (Council of Australian University Librarians, 2001)

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### APPENDIX

Guidelines for the main assignment (translated into English)

At an early stage in the course the students are required to select a subject and then search for related information. The assignment will be presented through a written log that should describe the different stages involved with the task. The written record (the log) should contain the following elements:

#### • Choice of subject

Discuss the main question/problem, possible ways for demarcations of the problem; would it be a good idea to divide the main area of interest into sub sections?

#### • Preparations

Identification of key words, both positive and negative ones. Give an account of how you could generate, develop and make your collection of key words effective.

#### • Strategy

If you have divided your subject into sub sections, discuss the order in which you deal with the different sections. Is it so that certain sections of your subject can be dealt with more satisfactorily in connection to particular sources of information? (Note that this element in the assignment is related to the next element).

#### • Information sources

Choice of databases and other sources of information. Discuss and motivate your choices.

#### • Evaluation and selection (of information)

According to which criteria can I choose (or reject) information? Are there any specific tools or strategies that can help me in this process?

#### • Reflection

Can I, when I have come this far, recognize my own process in those described in the literature. (Kuhlthau's information search process or Ellis's process with, for example, the element of "chaining"). Has Kuhlthau's uncertainty principle appeared in your process?

#### • Information management

How do you collect and bring order amongst (i.e. manage) the information you have found? Can you easily retrieve the information you have found?

#### • Presentation

Most likely you have a purpose with your information searching, (of course you do). Quite often one purpose can be to present information to others, in an oral or written way. Discuss citation techniques and choice of bibliographic style.

#### Note

1. A majority stated the importance of being able to access articles and other texts in printed versions – rather than electronic versions – since the need for being able to read and study texts with "the pen in hand" was experienced as very important.

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