

User Education at the Digital Library: Physical and Intellectual Access to Information through Digital Literacy

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Introduction

The Digital Library provides physical access to a vast variety of information resources. However, giving users physical access to information does not guarantee that they become informed (Buckland 1991). If at the same time, we look upon libraries as learning centres (see Tønning this volume), the Digital Library can play an equally central role in helping them gain “intellectual access” (Buckland 1991) to information. In this chapter, we discuss how information and digital literacy education can facilitate the user’s intellectual access to information. The chapter presents how the University of Bergen Library (hereafter UBL), in collaboration with three other Scandinavian higher education libraries, has developed online learning objects for the virtual classroom to help students improve their digital and information literacy. More specifically, the learning objects have been designed to help students with their information search process and use of information sources in their writing process.

This chapter is organised as follows. Firstly we outline why and how the learning objects came about, with a focus on the pedagogical framework and learning goals underlying the production of materials. Secondly, the learning objects are described. Subsequently, an overview of the first stages of the implementation process is provided, which highlights the collaboration between library and faculty. Finally, the conclusion summarises the main points in planning digital and information literacy user education at the Digital Library.

Background

A considerable number of Scandinavian academic libraries have redefined themselves as learning centres over the last years (see Tønning this volume). They do not just offer document collections, but also computers and working areas, as well as user support services and user education programmes which contribute to students’ effective learning (Fagerli 2000).

The information flow is larger today than ever. Libraries provide students

with both printed and electronic sources such as digitised documents, e-books, e-journals and open repositories. Apart from having access to a much wider range of library sources, students have become keen users of the open Internet and its search engines. The search for and use of information in our present society entail a number of challenges and needs, as identified for instance in the UNESCO Information for All Programme 2005-2006 (UNESCO 2005), The Prague Declaration “Towards an information literate society” (US National Commission on Library and Information Science and National Forum on Information Literacy 2003) and the Alexandria Proclamation on Information Literacy and Lifelong Learning (UNESCO and National Forum on Information Literacy 2005). These documents highlight the importance of digital literacy and information literacy for the information society. Information literacy allows the user to decide when and why they need information, where to find it, and how to evaluate, use and communicate it in an ethical manner (Chartered Institute of Library and Information Professionals 2005). In this way, information literacy plays an essential role in reducing the digital divide and in promoting tolerance and democratic values across cultures.

Since a great deal of information is nowadays accessed digitally, computer literacy and thus digital literacy have also become literacies of paramount importance. The Norwegian government has taken action within the education system to ensure that citizens become digitally literate. The white paper “Culture for learning” (“Kultur for læring”) (Ministry of Education and Research 2004) highlights, among the described education goals, the importance of digital literacy through the implementation of the Programme for Digital Literacy (2004-2008) at all levels of the educational system. Digital literacy is defined as consisting of both ICT skills and information literacy. Students at higher education institutions are expected to be offered education in information literacy by 2007.

The Norwegian Reform of Higher Education (Ministry of Education and Research 2001), introduced in 2003, encourages problem-based learning and a task-based approach to teaching, as well as new exam and evaluation methods. As a consequence, students are expected to write assignments and projects earlier and more often than they used to do. Students, as independent learners, need to be able to navigate in the information sea, which includes an ever increasing number of electronic resources.

The Programme for Digital Literacy and the Reform of Higher Education pose new pedagogical challenges for Norwegian academic libraries. Both library and faculty are aware of the fact that physical access to information alone does not make students information literate. Academic libraries have come to realise that they have a double goal to achieve: to make electronic resources available for students and to assist them in their learning process (Torrås & Vaagan

forthcoming). In terms of promoting digital literacy, library user education which focuses on information literacy, as defined above, will help students intellectually access the information they need and use it critically, creatively and ethically. In this way, the academic library looks upon itself as an integrating part of the higher education learning arena (Sætre 2002).

A User Education Programme for Information Literacy

Since 2003, UBL has carried out a number of projects to develop a new user education programme for information literacy (see Tønning this volume). The goal of these projects has been to move towards a situated learning model where the focus is on the student's needs and the learning process is contextualised. In the new face-to-face teaching programme, students acquire information literacy as they work with their academic texts (Arnesen *et al.* 2004). This situated model calls for closer collaboration with faculty in order to be able to provide embedded library courses in the curricula. The responsibility for successful acquisition of information literacy is to be shared by the student, the academic staff and the library staff.

The situated learning model is challenging as it requires both traditional roles and new pedagogical skills from the librarian. As Kuhlthau (1994:114) argues, the librarian can adopt “[...] a variety of roles in relation to the user that may be thought of as different levels of service”. Traditionally, the librarian has acted as a *locator*, *identifier* and *advisor* (Kuhlthau 1994:116-118) in their interaction with their user. The kind of mediation that these three roles entail proves to be effective and helpful at later stages of the information searching process,¹ when users have a clear task focus and thus can articulate their information needs in a specific way. However, Kuhlthau notes that, at the early stages of the information searching process, the librarian can be more helpful if, as a *counsellor* (Kuhlthau 1994:118-120), they provide intervention into the process of the user. At the early stages of the information searching process, the student's cognitive state of mind is characterised by uncertainty. The librarian, like the academic supervisor, can help the student by guiding them through the creative process of constructing meaning, that is, of seeking certainty and clarity in their academic work. The librarian's counselling role is determined by the student's information needs at each given point.

UBL's face-to-face user education programme for information literacy builds upon the idea of process. The focus on learning as a process contributes to the acquisition of transferable skills and therefore to lifelong learning. Further, our user education programme encourages the librarian, as a pedagogue, to

¹ See Table 2 for a summary of the information searching process as described by Kuhlthau (2004).

consciously decide on which role to play depending on the information search stage the student is at and thus on their specific information needs at that point.

A first evaluation of the new information literacy courses by students and library staff at UBL showed that our user education programme should be better tailored to the specific needs of postgraduate students. Establishing learning goals for more advanced information literacy skills and providing a closer link between searching and thesis writing in the courses emerged as clear areas for further course development. The evaluation also showed that user education should cater for two increasing student target groups in Norwegian higher education, namely international and distance education students.

The project Digital Literacy through Flexible Learning: Information Searching and Use of Information Sources in Thesis Writing² was launched in 2005 to support students in their learning process by promoting their digital and information literacy. The project aims to develop a set of learning objects, *Søk og Skriv* (“Search and Write”), specially designed for distance education students at postgraduate level. The learning objects can be integrated in web-supported courses at higher education institutions. An English version of *Søk og Skriv* will be made available by 2007 to cater for international students.

The Learning Object Set: *Søk og Skriv*

Søk og Skriv (“Search and Write”) has been designed as a set of learning objects to promote students’ information and digital literacy as they work with their academic projects.³ More specifically, students are guided through the information search and writing processes. Further, they are encouraged to reflect on the ethical, critical and creative use of information and to engage in a variety of activities that help them in the process of writing a research paper or a thesis. Searching and using information are presented as processes that go hand in hand with the writing process in the students’ wider process of constructing meaning. The searching process helps the student narrow down their research question. By the same token, a gradually more specific research question enables the student to conduct searches for more pertinent information.

² Digital Literacy through Flexible Learning (www.ub.uib.no/prosj/DK/index.htm) is a two-year collaboration project between the academic libraries in Bergen, that is, University of Bergen Library, Bergen University College Library and Norway’s Business School Library. Aalborg University Library, Denmark, also collaborates in this project. The project is funded by both Norway Opening Universities (Norgesuniversitet) and the collaborating Bergen libraries.

³ *Søk og Skriv* is freely available on www.sokogskriv.no.

It is important that the learning object contents take into account the students' situation in their learning process. At postgraduate level, students have already acquired knowledge on academic writing and information searching through their study years. The evaluation of our new information literacy courses showed that postgraduate students had different needs from undergraduates when carrying out their academic work (see the previous section). The goal of the learning objects should thus be to help postgraduate students meet their specific needs. For this reason, one of the first project tasks was to establish a clear set of learning goals, and based on them, to design the learning object contents. More specifically, an attempt was made to distinguish learning goals for undergraduate and postgraduate students. In our process of establishing these two sets of learning goals, we were inspired by the information literacy standards developed in the United States (The Association of College and Research Libraries 2000; Middle States Commission on Higher Education 2003) as well as in Australia and New Zealand (Bundy (ed.) 2004). Accordingly, we defined information literacy as consisting of the five components described in Table 1 below, and decided on which specific components the library user education should work on in collaboration with faculty and/or the student.

Information literacy components	Learning Goals	
	Undergraduate level	Postgraduate level
1. Formulating a research question and expressing an information need	<ul style="list-style-type: none"> • To choose a topic and become acquainted with formal project guidelines • To formulate a research question • To understand that information is needed to expand one's knowledge, and to support one's ideas and opinions • To define a specific need for information 	<ul style="list-style-type: none"> • To choose a topic and formulate a research question • To justify topic choice through: <ul style="list-style-type: none"> ◦ Placing it in the context of earlier research ◦ Considering theoretical framework and methodology • Assessing project feasibility
2. Choosing and accessing information sources. Locating and collecting information	<ul style="list-style-type: none"> • To distinguish between information sources • To judge the appropriateness and quality of sources for the task at hand • To search in different information sources with appropriate search strings • To locate and access documents 	<ul style="list-style-type: none"> • To understand how information is quality assured in the publication process • To judge the appropriateness of the information source for the task at hand • To search in subject-specific sources with appropriate search strings based on special subject features • To evaluate search results in order to decide appropriateness and relevance to the topic • To change search strategy to ensure that the amount of information is sufficient to solve the task at hand
3. Evaluating sources critically	<ul style="list-style-type: none"> • To understand the concept of critical evaluation of sources • To become familiar with basic evaluation criteria • To recognise the relationship between good use of sources and academic quality in own one's and others' works • To evaluate the appropriateness of relevant sources based on own academic task 	<ul style="list-style-type: none"> • To evaluate academic works in terms of content, context and use of sources. • To master the use of evaluation criteria in a variety of sources (websites, academic and popular articles, books) • To be familiar with and critical of peer reviewing and impact factor as quality assurance criteria.
4. Using information in own academic texts	The learning goals for this component are the faculty's and the student's responsibility.	
5. Critical reading and academic integrity	<ul style="list-style-type: none"> • To understand what academic integrity is • To understand what plagiarism is and its implications • To do referencing in a correct way 	<ul style="list-style-type: none"> • To use a reference management tool for referencing and for systematising gathered literature • To be familiar with research ethics and the copy right law

Table 1. Information literacy learning goals for library user education (University of Bergen Library 2005).

The learning goals in Table 1 show postgraduate students' greater needs for reflection and critical thinking in their search for and use of information. They are expected to be able to justify to a greater extent their choices of information sources and their information use in their research work. Further they are expected to use information in their academic production in a way that a contribution to new knowledge is made in their research field. Writing academic texts for knowledge dissemination in academia also raises a number of ethical issues which students should be able to tackle in a responsible way.

Søk og Skriv helps students deal with the information searching and research issues mentioned above. It consists of five main learning objects, which in turn are based on Kuhlthau's (2004) model of the information searching process. The learning objects presented in Table 2 cover the information searching process as well as a number of related writing actions. In addition they cover other essential information literacy components such as the creative, critical and ethical use of information. Academic writing plays a central role in students' learning process. As Dysthe (1996) puts it, learning is both an individual cognitive process and social interactive process. Language, and thus writing as a form of expression, connects the cognitive and the social learning processes.

Learning object	Information search process	Writing actions	Other actions or strategies
1. Task initiation (Oppgavestart)	Task initiation (Stage 1) Topic selection (Stage 2)	Brainstorming Mind mapping Reflection texts	Reflecting on research ethics
2. Get an overview (Få oversikt)	Prefocus exploration (Stage 3)	Annotated bibliography First outlines Project statement	
3. Find and combine keywords (Finn og kombiner nøkkelord)	Focus formulation (Stage 4)	Listing and structuring keywords	
4. Search, evaluate, collect and write (Søk, vurder, samle og skriv)	Information collection (Stage 5)	Draft writing Writing for the study group	Critical evaluation of sources Referencing
5. Closure (Avrunding)	Search closure (Stage 6)	Conclusion writing Final writing up	Ethical use of sources Presenting one's work

Table 2. Søk og Skriv : Learning object content

To illustrate the different phases of the writing and information searching processes, students are invited to follow character Oda, a distance education student, and her progress in writing a research paper. To promote the student's independent learning, each object includes activities which encourage the student to produce different text types (e.g. brainstorming and outline writing) in connection with their own thesis or research paper writing.



Figure 1. *Søk og Skriv* homepage (www.sokogskriv.no)

Furthermore, the learning objects include activities that encourage the student to reflect on the information searching process from choosing their topic and research question to formulating and combining their own keywords. The goal of these activities is to help the student become more aware of their information needs, and help them find strategies to meet those needs. The student learns by doing and reflecting (Dewey 1944), which lies at the heart of the constructivist view of learning. As Kuhlthau (2004) argues, information seeking is an intellectual process. It is important to make the student aware of how their information needs evolve from a vague awareness of an information gap and culminates in their location of information that contributes to constructing meaning. This kind of learning has transferable value, and prepares the student better for the information tasks they will encounter in their future private and professional lives.

***Søk og Skriv* in the Virtual Learning Environment: Collaboration between Library and Faculty**

Alongside the development of the learning objects, their integration in the university virtual learning environment needs to be worked out. At the time

of writing this chapter, two integration models have been designed. These two models will be tested through two pilot studies.

In the two pilot studies, the learning objects are integrated in the virtual learning environment of two different distance education degrees at postgraduate level: health promotion (University of Bergen) and midwifery (Bergen University College). These health promotion and midwifery degrees are actually based on a blended learning model. Students attend both virtual and on-campus classes. These two degrees highlight problem-based learning and evidence-based research. At the time the students participate in the pilot studies, they are at the initial stages of writing their thesis. The teaching which has been planned for the pilots, and where *Søk og Skriv* has been integrated virtually, aims at assisting the student in the totality of their research process by promoting both information literacy and academic writing skills.

The evaluation of the pilots will be based on a survey and a focus group interview. The evaluation of one of the pilot studies will focus on the contents and layout of *Søk og Skriv*. The other pilot will in addition become part of a larger research project to determine learning outcomes, and what practical implications they may have for the students' professional life.

Collaboration between library and academic staff is an essential condition for successful embedded digital and information literacy education. For this reason, the project Digital Literacy through Flexible Learning counts with an advisory committee assisting the project members in the tasks of developing the learning objects and planning the pilot studies as well as designing the evaluation of the learning objects. The committee consists of academic and library staff members as well as students.

The collaboration between academic and library staff members when designing the pilots has been fruitful for a number of reasons. It has been easier to find ways to achieve the established learning goals, whether they were the faculty's or the library's main responsibility. The academic staff have helped decide on what course content and timing was best suited to the students' specific learning needs. Last but not least, through this project, new communication channels have been opened between faculty and library for further collaboration. Both faculty and library share the ultimate goal of empowering the student, that is, promoting "[...] the development of independent learning skills, also known as the "learn-how-to-learn" approach, within the wider perspective of lifelong learning" (Andretta 2005:1). Our project work has provided both parties with strategies for how this goal could be achieved in a more formalised and comprehensive way. Empowering the student through digital and information literacy education has become a gradually more explicit goal. In trying to define it and discussing how to achieve it, faculty and library have become more aware

of what responsibilities each of them have in helping students learn how to learn. In this context, academic and library staff have acknowledged the value of the librarian's facilitating role of *counsellor* in the student's process of constructing meaning. In this way, faculty counts with the library as a new partner in their task to empower the student through the development of independent learning skills.

Conclusion

This chapter has presented UBL's educational development strategies within the wider framework of building up a digital library. UBL's user education seeks to facilitate the students' navigation in the digital information sea, with the ultimate goal of empowering them through information skills that promote their lifelong learning in our current knowledge-based society. Through the project Digital Literacy through Flexible Learning, the learning object set *Søk og Skriv* has been created to improve students' digital and information literacy skills as well as academic writing skills. *Søk og Skriv* has been specially designed for postgraduate distance education students. Different models of integration of the learning objects in the students' virtual learning environment have been developed.

Collaboration between faculty and library has been a key factor for embedded teaching in a blended environment which is adequately tailored to the students' specific learning needs. The faculty and library's joint work in this project has laid the ground for further wider institutional collaboration in the task of embedding information literacy education in the curriculum. Alongside institutional collaboration, UBL needs to work further on librarian training programmes that promote their different mediating roles in their interaction with the user, and amongst them, the more challenging role of *counsellor*. It is through the pedagogical training of librarians that the digital library can be built up as an integrating part of the higher education learning environment.

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