

Towards a Learning Society – Exploring the Challenge of Applied Information Literacy through Reality-Based Scenarios

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Abstract

This paper outlines the role of information use in society to illustrate the process of developing a learning society as envisaged by the Information Literacy Research Centre which is located within the Linköping University Library. The section on the theoretical framework discusses learning from different pedagogical perspectives, the importance of reality-based scenarios and also proposes a new model, which could be described as an extension of the well known and often cited Kuhlthau's Information Search Process (ISP) model. The successful implementation of this new model, Applied Information Literacy Education, is explored through the outlines of the following courses, Civic and Public Communication - the Citizen in the Information Society, and, Health Promoting Organizations. The paper concludes by reflecting on the theoretical and practical implications of applying the extended Kuhlthau's model, as practice has shown that this approach is useful for pedagogical developmental work, including curriculum development in general, and specifically for information literacy programmes. This is presented as a necessary step for the promotion of a learning society based on information literacy and as a challenge not just for information literacy educators, but for other educators as well.

Keywords

applied information literacy, e-learning society, lifelong learning, reality-based assessment, information search process, authentic assessment.

Introduction

The instructional programmes of the library¹ at Linköping University in Sweden have a long history. Librarians have taught formal instruction sessions since the 1970s. Over the years, the programmes have evolved from library orientation to bibliographic instruction, and since the beginning of the 1990s, they have developed into information literacy provision. The library has successfully adopted information literacy as an organising principle that informs all of its work and shows commitment to an active role in the preparation of students for a lifetime of purposeful learning. CeBIT, or the Information Literacy Research Centre, is a special branch of the library which was established in 2000. The centre is a resource for pedagogical innovation and development within the field of library and information science as well as in support of Higher Education provision within the University. The centre offers interdisciplinary credit courses, seminars and other programmes to fully integrate information literacy in the University's curricula, and to support librarians, information professionals and teachers in their pedagogical roles. CeBIT also aims to contribute knowledge especially within the field of both theoretical and practical aspects of information literacy education, focusing primarily on knowledge and learning in a modern society, information literacy as a process of learning, curriculum development in Higher Education, pedagogy and the pedagogical role(s) of librarians and libraries of today and tomorrow.

In this paper we reflect on the need to reform Higher Education for the Learning Society, promoting information literacy and lifelong learning for all. We aim to describe the implementation of the Applied Information Literacy model sharing some experiences and good practices that could inspire other information literacy educators and lead to new developments of information literacy programmes. To exemplify the Applied Information Literacy model, and illustrate how this is fully integrated into diverse curricula, this paper outlines the syllabus of two courses delivered at undergraduate level. The first one comprises 10 credits and consists of 10 weeks full time, that is 40 hours per week, while the second one is a 20 credits course covering 20 weeks in full time mode.

¹ This term this will be used throughout the rest of the paper.

The Information Society and Lifelong Learning

The information society is characterised by a constantly increasing volume of information, advancements in information and communication technologies, and the overall changing communication patterns. These changes are accelerating, making interaction with the information environment increasingly complex. The context of the information society presents both opportunities and challenges for a new education policy that is responsive to this new environment. This new learning reality requires a radical review of the whole learning enterprise. Niederhauser (1996) proposes a view of an information society which demands critical thinking and problem-solving skills of its members, and which raises questions surrounding the centrality of information literacy and other newly emerging literacies in society, such as civic and health literacies. Librarians, in their role of information literacy educators, should analyse the surrounding environment, the new information universe and the technological milieu, in order to identify problems, and further enhance provision in this area. This could include the development of specific priorities and strategies for the creation of sustainable learning environments and foster students' competences in the new global workplace. In other words, librarians have to strengthen their workforce readiness to respond to constantly changing information environment. Lifelong learning is the outcome of an information literate society, but as noted by Christine Bruce (1999), information literacy is by no means an end product, but an applied concept concerned with the mastery of processes, and also something to be learned as well as being an effective learning tool. Within this context, information literacy is an appropriate foundation for lifelong learning, as it depends upon an understanding of how data and information are gathered, analysed and synthesised to become meaningful knowledge, together with an ability to apply higher-order thinking to these processes.

Towards a Learning Society

Don't teach me – let me learn (unknown source)

Information and knowledge are important conditions for a progressive social development, and it is predicted that the wellbeing of society will increasingly depend on our ability to use globally produced knowledge and experience. The ability to change is largely determined by our capacity to retrieve, process and utilise relevant information. Regardless of whether we scrutinise the socio-economic situation at individual, organisational or societal level, we find a definite need for information and knowledge to enable us to keep abreast of developments. Living and working in the information age require access to, and use of, good quality information to keep in touch with developments, given that these presuppose some kind of information use (Lantz, 1999). Today's work environment requires effective use of information and management of knowledge to keep a strategic advantage within a global market. Our modern society calls for a new kind of knowledge and competences. The individuals' prerequisites to initiate developments and to solve complex problems are crucial to ensure a competent working life, and these prerequisites pose higher demands on intellectual flexibility (Lantz, 1999). Today's organizations are increasingly information and knowledge management organisations which aim to become optimal learning organisations. The work routines are becoming more and more complex and abstract in character. Employees are expected to keep up with rapid technological advances, to streamline operations and to become proactive problem solvers. In addition, the ability to learn and the development of intellectual innovation have to be updated throughout one's working life (Lantz, 1999). The Learning Society is an educated society, committed to active citizenship, liberal democracy and equal opportunities. The aim is therefore to provide learning opportunities to educate adults to meet the challenges of change and active citizenship (Edwards, 1997). Universities, for example are increasingly been asked to produce students and researchers who are information literate and self-reliant, able to act in a rapidly changing, complex and information-rich environment for optimal competitiveness and success; in other words learners with capacity for lifelong learning (Lantz, 1999).

The Change of the Pedagogical Discourse: The Role of Librarians

"[...] a librarian should be more than a keeper of books; he should be an educator [...] All that is taught in college amounts to very little; but if we can send students out self-reliant in their investigations, we have accomplished very much" (Robinson, 1876: 129).

When teaching information literacy we must determine the effectiveness of the learning activities employed and the real outcomes of our work. We have to emphasize concepts rather than the teaching of research tools, and we have to shift the focus from the tools to the process, thus acknowledging the paradigmatic shift from teaching to learning. We have to emphasize the active role of the individual in constructing understandings and to make him or her see events and items from multiple angles in order to develop a broader perspective on what and how to learn. But, as stated by Limberg (1999), librarians often prefer to focus on the information search process and disregard subject contents or learning outcomes. Instead, librarians have to be aware that information literacy is not a set of skills that can be developed in isolation, therefore they have to consider the relationship between information literacy and other generic skills.

It has been argued (Asher, 2003) that librarians are not fit to teach students to extract information from resources, to theorise, to locate meaning, to analyse data, or evaluate ideas because this lies outside their expertise. The authors of this paper strongly disagree with this view and propose the view that librarians can and must show students how to analyse information as it cannot be assumed that students are able to go from teacher-defined purpose to understanding. Sometimes in the papers produced by students there is no evidence of critical analysis or reflection on ideas, content or facts. They do not realise that the resources they use may be subject to cultural, political, industrial, national or other bias. Loertsher (1996) emphasised that students need to spend a great deal of time consuming the information they find by reading, viewing and listening, but too many students skip this step and rush into the completion of assignments. Students need to make deeper, more analytical use of information and librarians have the responsibility to facilitate this process. Skills for critical and analytical use of information are seldom coached by faculties or the library, and this often results in recycled information rather than cognitively processed knowledge. Therefore, we have to coach the construction of knowledge from information and help the students "interview" information by employing meta-cognitive strategies through reflective conversations to establish key understandings, ideas, themes concepts, key opinions, arguments, effects and solutions.

Adult learners need to focus on the learning process as opposed to the content to promote independent and self-directed approaches to learning, and keep up-to-date by adopting a lifelong learning attitude. The focus has to change from the result of teaching to the learning process itself. This is achieved by ensuring that learners actively engage their prior knowledge and skills, and by stressing the importance of identifying their own strengths and weaknesses in a wide variety of contexts that cover both social and academic environments. This active learning process is promoted through the writing of assignments, projects and through cooperative learning. This approach is based on our belief that librarians must enhance their information literacy teaching abilities beyond that of basic user instruction to include new kinds of outreach activities, services and approaches to meet the needs of those with diverse and multiple literacies (Raseroka, 2005).

Applied Information Literacy through Reality-Based Scenarios

In the traditional education system students receive information without any connection with real life situations. However, the challenge faced by any educational programme is to create a learning environment and a curriculum that enable students to learn new knowledge, access previously acquired information from a variety of disciplines, and most importantly, to apply this newly constructed knowledge to the complex and constantly changing world. Learning takes place in the space between the actual reality and the potential which Vygotsky (1978; 1997) defined as the zone of proximal development. To bring about optimal learning the facilitative roles of educators are crucial, and these are closely connected with the use of ICT in web-based distance education. This poses a number of challenges for teachers and librarians, such as creating space for students to develop meanings and make informed authentic choices, leading to a constructivist learning that empowers individuals and strengthens their capacity to act. Change in students' behaviour is achieved by looking at issues from different angles, to see different theoretical viewpoints, in order to accomplish a change of assumptions and beliefs. The practical problem is how to create intervention strategies to

fully facilitate this type of learning. During the last twenty or thirty years, we have seen a dramatic shift from tutor-centred to student-centred learning, where learning is directed by the learner and not by the teacher, and where this process is enhanced by the tutors' use of the learners' pre-existing knowledge as a starting point for new instruction.

According to educational research a contextual perspective of learning including theories of, above all, situated learning should be emphasised (Lave, 1988; Lave & Wenger, 1991; Chaiklin & Lave, 1993). This theoretical view emphasises the situated nature of learning where knowledge is seen as a product of the learning activity, the context, and the culture in which it is developed and used. Seen from this perspective, learning is a socially constructed process situated in the culture in which people act, negotiate meanings and construct understanding that are progressively developed throughout their life time (Lantz, 1999). Therefore, learning can be conceived as an ongoing process of revision of meaning (Marton, 1981; Marton, 1986; Marton & Säljö, 1984; Marton & Booth, 1997). However, learning at the university rarely emulates the learning that occurs in the real world and we address this omission by making sure that the project scenario in our courses frames the essential question in an authentic, real-world context. The challenge is to stress the curriculum's relationship to specific work-environment situations.

The Challenge of Developing Curricula for the Real World

"The creation of a learning culture which produces students with a capacity and desire for Lifelong Learning requires a major shift in the way we teach" (Brage & Lantz, 2002: 185).

Courses need to be created within a context that enables students to pursue their own interests and needs. It is important to appreciate the lesson of case-based teaching involving real stories, real contexts, told by real people and at the right time. The more the situations being studied relate to the students' areas of interest, the more likely it is that the students will wish to know more. Learning to communicate, function with others, and reason are the most important parts of any curriculum. Communication, reasoning, understanding, and human relations are all processes which are best taught by experiential learning. Every student, indeed every adult member of society, needs to be constantly learning how to communicate, how to get along with and understand others, and how to think. These processes are critical for any learning situation.

Students should know what the goal of the course is and this goal must be realistic to ensure that students can accomplish it successfully. When students know where they are going it helps them focus on learning the skills that ensure a successful outcome of this process. For example, students must learn to articulate and progressively refine their research questions in order to conduct more precise searches. Students search behaviour ought to be an ongoing concern for those committed to designing and implementing effective information literacy programmes. Students must learn how to evaluate conflicting information based on differences in historical, theoretical, or empirical contexts. They must be able to decipher meaning and express ideas through a range of media as well as master referencing practices through the appropriate citing of sources. In the past the education process has been guided by the need for assessment and, in order to achieve this goal, educationalists focused on what was easily testable, which often meant assessing students' knowledge of vocabulary items on multiple choice tests, and rarely meant focusing on controversial issues for which there was no clear answer. Simply testing an isolated skill or a retained fact does not effectively measure students' capabilities. To accurately evaluate what a person has learned an assessment method must examine his or her collective abilities. This is often referred to as authentic assessment which presents students with real-world challenges that require them to apply their relevant skills and knowledge (Guba & Lincoln, 1989).

Case-Based Learning

There is a need for reality-based information literacy programmes to respond to societal demands in different sectors, and as a result, case-based teaching is wide-spread across disciplines. The pedagogy of case-based education generally emphasises active and situated learning and approximates 'real life' conditions. The use of 'real' cases is central because people learn from acting in authentic contexts. The case may either illustrate a point or serve as a basic reference point, and students should be able to employ their knowledge and practice in ways that enable them to make a connection between the curriculum and real-world demands, and test their abilities in meaningful work-related contexts. Direct application of theoretical foundations is a skill that is increasingly

valuable, especially in information literacy. We have found that thematic information literacy courses including reality-based scenarios and cased-based teaching can be very successful in helping the students develop and practice applied information literacy skills because it is based on the learning-by-doing approach. Here learning is contextualised because real life problems, or assignments, are presented in a way that is relevant and meaningful to the learner, thus enabling students to acquire skills that allow them to function and contribute to society. We believe that students acquire knowledge more effectively when learning in the context of a coherent 'whole' and when they connect what they are learning to the real world. Each scenario or case sets up a possible situation and offers a variety of options that could be chosen to deal with the situation. The use of a scenario helps the learners relate to the content, although an initial induction to information literacy competencies is necessary to ensure that the learning is focused, fully integrated, and tested. When learning to swim one has to get in the water. Similarly in other learning situations, one has to practice in a real world context in order to achieve the independent learning attitude advocated by information literacy.

Applied Information Literacy Programmes in Action: Two Complementary, but Different Cases

'Knowing is not enough; we must apply. Willing is not enough; we must do!' (Goethe)

We need a new kind of information literacy, what we refer to as Applied Information Literacy which is suited to a new learning society. In this paper we use the general definition of information literacy as the ability to make effective use of information including analysing, evaluating and, organising it. However, this concept goes far beyond these abilities and represents a fundamental aid towards self-help and the development of a lifelong learning attitude. With this perspective in mind we redesigned our Information Literacy Programmes with the aim of encouraging the students to explore the unknown, and to make them fill the gap between rhetoric and reality. In our courses the students are required to employ complex research practices and to present papers that reflect greater depth of knowledge. In order to accomplish this, the students must take responsibility for their learning through active engagement in activities such as reading, writing and research. Reading requires a capacity to work with a large collection of information, and therefore we introduce activities fostering reading comprehension by making students identify the steps in the reading process that enable an effective selection and organisation of information and result in a full application of what has been learned through reading. The writing calls for an ability to communicate clearly, while the research process requires meta-cognitive strategies to compel orderly, systematic and imaginative forms of inquiry.

We have often noticed that students are unable to define the topic adequately, that they ask questions that inaccurately represent their true information needs, and lack sufficient background knowledge to know what they need to find out. In response to these problems we provide an authentic learning purpose and stress the links between purpose and curiosity, thus we avoid focusing only on the selection of information and instead emphasise its analysis. Moreover, our programs promote a model of reflection that demonstrates students' understanding of concepts, knowledge, skills and attitudes, accomplished through lived experiences.

Civic and Public Information: The Citizen in the Information Society course

The Internet enables unprecedented flows of information which raises a number of questions about how people can interpret, manage and evaluate this information. The uncertain quality, and the expanding quantity of information, produced by the Internet pose large challenges for society and its users. The sheer abundance of information will not in itself create a more informed citizenry and in this context information literacy alone is no democratic guarantor. Therefore, we need a complementary cluster of abilities necessary to use this information effectively, in other words we need to extend the information literacy competences into a civic literacy. By this we mean that information literacy is a prerequisite for participative citizenship, and as stated by Bundy (2002), librarianship is the only profession that acknowledges the link between information literacy and personal and democratic empowerment, lifelong learning as well as societal and economic development. Flanagan and Faison (2001: 3) define civic literacy as "knowledge about community affairs, political issues and the processes whereby citizens effect change, and how one could become informed if one were not already." Civic literacy, therefore, embodies the knowledge and skills that we need for effective participation in the community, government, and politics. Our approach in this course is to combine academic instruction and community information with a particular focus on critical, reflective thinking and civic responsibility.

Citizenship in a modern democracy involves more than knowledge of how to access vital information. The capacity to recognize propaganda, distortion, and other misuses and abuses of information must also be included. The key issue here is not information access, but how to integrate and understand this information, and how to use it selectively. According to Ranson (1994), the challenge of the modern era is the creation of a moral and political order that expresses and enables an active citizenship within the public domain. The aim of this course is to foster critical thinking skills in students so they can analyse information independently, and investigate their own beliefs and assumptions as well as other peoples' in order to develop their own ideas and respond to a diversity of views in appropriate ways. The massive changes in the information and communications (ICT) industries affect citizens in every corner of their everyday lives. These changes are taking place simultaneously and at many levels, thus calling for a complex set of responses where the effects on social contexts, as well as assessment of the implications of ICT on the democratic process are fully evaluated. The course' syllabus include:

Theories of communication. The students are introduced to the basics of communication theory, including interpersonal, small group, organizational, and mass communication. They study a variety of theories related to these topics and examine the cultural impact of new communication technologies and contemporary media systems.

Civic communication in a democratic society. Past and present. The role of communication in the civil functioning of a democratic society are examined, as well as a range of interconnected issues concerning the politics/mass media relationship. These include: the interaction of media practice and political strategies, the concept of democracy and the media, civic communication and the public sphere, media and political influence and the problems related to current civic communications.

Information design. This part of the course focuses on design theory and research promoted by effective interfaces. Here the students try to determine the most efficient way to represent complex information without distorting the data conveyed.

Own production of civic information. The focus of this part of the course is to develop the students' ability to derive viable concepts in the creation of meaningful, communicable, and aesthetically pleasing messages conveyed through a single product (brochure, Web page, etc). The task is to communicate risks to an audience, such as acryl-amide in food or the risk of a bird flue epydemic, and this provides the students with a practical writing project that prepares them for professional communication in the future. This approach is described as publishing literacy.

Information behaviour theories. This part of the syllabus aims to give the students a common background for understanding different information-behaviour contexts.

Information literacy theories. The intention here is to discuss and evaluate different theories and definitions of information literacy in order for the students to begin to form their own personal definitions.

Information seeking strategies. This covers an introduction to ideas associated with the use of flexible and adaptable information seeking and access to different information sources, as well as the development of the associated generic skills underpinning these practices.

Literature seminar. Here the students get an opportunity to demonstrate proficiency in searching information for a well-defined topic. The information found is then conveyed through oral presentations. The primary focus of this seminar is to foster students' reflection on the information gathered.

Visual communication. This session helps the students gain a better understanding of how images communicate information, shape our beliefs, and arouse our emotions. We explore a variety of visual media used in diverse areas of life and work. This develops the student's semiotic skills which are used to interpret visual images in order to convey meaning.

Theories of democracy – e-democracy. The aim here is to discuss the pillars of democracy, to appreciate its practical meaning and the value of democracy to the individual. We also discuss e-democracy and explore in particular the impact of democratic strategies employed by governmental agencies and municipal authorities.

Risk communication. We examine various models of risk communication, the diverse roles assumed by the public and means of ensuring that risks are communicated both effectively and ethically. A central concern in the discussions about risk communication has been the role of the public in shaping policies designed to respond to various risks (environmental risks, health risks, etc.).

Media literacy. The focus of this part is the role of media in a democratic society.

Practical writing and publishing. The overall goal here is to teach student how to communicate actively, competently and with critical awareness in 'real' life situations.

In our course we try to introduce writing into the curriculum and the course ends with a reflection paper where the students have to apply and incorporate the theories they have encountered into their writing. Individual work also includes the presentation of information and the critical assessment of the process of obtaining that information. Grading is based on content and support of evidence, but also on grammar and format including referencing and citing. The papers are then published in a student anthology, so that they learn about the publishing roles and the publishing process itself in an authentic situation. We promote publishing as an extension of the writing process, one that gives purpose and motivation to the work of the students as they normally take greater care to critically examine what they have written and spend more time on their papers because they understand that other people will read their work.

Health Promoting Organizations course

The idea of a health promoting society highlights the importance of collective action built on an informed population, equitable participation in decision-making, and a sense of belonging. Health promotion is the process of enabling people to exert control over the determinants of health and thereby improve their health. It is a process directed towards enabling people to take action through strengthening the skills and capabilities of individuals, groups and communities. All actions to promote health occur within a social context. Health Promotion must be socially and culturally relevant and support democratic and participatory processes in society. It is also about building the capacity of communities to take action and to act as catalysts for change. Health Promotion requires political, social and individual actions. All these processes need to be based on quality information. Against this background universities, and other educational institutions, have a vitally important role to train students become health promotion agents of different kinds. A wide range of professions should be introduced to health promotion concepts including health literacy and information literacy as well as what constitutes a health-promoting society, and how to develop strategies for change. This challenge should be seen as an investment in education as well as a commitment to health and democracy.

The scientific basis for health promotion is drawn from a wide range of disciplines thus making this subject interdisciplinary. The literature indicates that evidence bound to social, political and cultural contexts as well as theories and behavioural models of change continue to guide decision-making and practice as a scientific basis for action. The term health literacy refers to an individual's ability to read, comprehend, and act on medical or health information. Bernhardt et al (2005) define health literacy as an individual-level construct composed of attributes that can explain and predict one's ability to access, understand and apply health information. The concept was introduced by Simonds (1974) to describe the impact of health information on the educational system, health care system, and mass communication. Since then the information landscape has changed considerably and has created new opportunities and challenges to the traditional health information dissemination and utilisation. The Internet with its increasing provision of health information, communication, and online advice has been seen as a great contributor of the promotion of health literacy and health competence. The last decade has seen a rapid growth in the availability of free health information via the Internet, where millions of people go to Internet health-sites, which provide, at the best, relevant and beneficial information and advice, or at worst, present incorrect and therefore misleading information.

The ability to search for, find and adequately understand and use health-related information is critical in the modern information society as well as in the health promoting society. Health literacy is clearly influenced by the level of information literacy that one possesses. Therefore, the challenges of health literacy are very much intertwined with those of information literacy, and developing the latter should be seen as a key to evidence-based practice in health promotion. When an individual's ability to

access, understand and utilise health information is lacking or is unequal to the complexity of the information this might influence health outcomes and lead to failures of various kinds. Information literacy training must be integrated in interventions for improving health literacy to stimulate the progress toward eliminating health literacy barriers in the delivery of health care and in other health promoting arenas. Information literacy should be seen as fundamental to strengthen the evidence-base information on which health promotion policies and practices are founded and to ensure effective dissemination of this information to the appropriate policy-makers and practitioners.

Thus, Information Literacy represents a viable, strategic response to democracy and inequity in society in the same way as health literacy addresses the inequity in health. Against this background the course Health Promoting Organizations was developed and implemented focusing on three main concepts: the critical issues of health promotion, health literacy and information literacy, and the relationship between them. The course could be described as an action-oriented interdisciplinary education aiming at creating conditions for the development of action plans to improve health promotion strategies. It is a distance education course which is mainly based on the web within the Swedish National Net University². The course comprises four parts of five credits each:

Information literacy and learning. The first part covers an introduction to information literacy in the context of independent and lifelong learning, as well as a requirement for a progressive development in various sectors of society including the health area, where a combination of theory and practice are explored. The main focus here is on the importance of information literacy as a promoter of a lifelong perspective, and this complements the distance learning provision as well as the delivery of health promotion activities in various arenas, such as working places, schools, and communities. The concept health literacy is introduced and an analysis is made of how this relates to information literacy, civic literacy and other crucial literacies necessary in modern society. Individual, organisational and societal perspectives are also analysed.

The students' information literacy skills are developed through training on information search strategies, knowledge of relevant information resources and critical evaluation of sources based on two tasks. The first task is a realistic case study 'Warning on Internet Health Advice' where students are asked to search for health related information on the Internet and present a reliable report on their findings. In the second task the students get an opportunity to demonstrate proficiency in searching information about a self-defined topic within the health promotion field and present their findings in a literature review. The focus of this part of the course is to encourage students' reflection on the information seeking processes including an assessment of meta-cognitive thinking and the information gathered.

Perspectives of 'healthy' organisations. This part of the course focuses on definitions and concepts central to health and its promotion, thus covering the theoretical basis for the determinants of health. Further development of students' information literacy competences is encouraged through information seeking, critical evaluation and use of relevant information/research findings for evidence-based learning.

Organisations in a organisational and communication theory perspective – Research methods and strategies for health promotion and change. In this part of the course we assess the impact of this perspective on various organisations. The focus is also on research methods and educational strategies such as problem-based learning as a way of bringing about health promoting changes.

Theoretical and empirical study of health promoting organisations. Finally, students' learning is structured around investigating, developing visions, planning and taking action, and bringing about positive change in an organisation. Students' findings are presented in a paper, which is discussed at a seminar and then published in a student anthology.

Both courses emphasise the learning process itself which is facilitated through problem solving strategies in real world situations in order to ensure that students can operate as effective information literacy people beyond the classroom.

² <http://www.natuniversitet.se> (Accessed: 20 December, 2005)

Towards a Holistic Model of Information Literacy

Information Literacy has broad implications for the individual, the educational system and society. Thanks to its complex pedagogical practices it ought to be seen as a way of thinking that allows individuals to be flexible lifelong learners who will succeed in the information age, rather than being defined as a set of individual tasks or skills. We have to make the students explore all different aspects of information literacy in order to learn the pathways to knowledge. Knowledge, as we see it, is the result of active understanding by the individual, and not a passive accumulation of information. We also contend that the internalisation of knowledge cannot be accomplished in full until its understanding is successfully communicated. The emphasis on meta-cognitive skills promoted by an information literacy approach points to a synergism between the ability to manage information and the complex thinking processes involved in doing research. As a result, a variety of definitions of learning including constructivist, cumulative, structural, self-directed, goal-oriented, situated, abstract, co-operative, and individually different processing of knowledge, formulate the perspective underpinning our Information Literacy Programmes.

We have to recognise the range of contexts in which learners experience information literacy and we have to expand our understanding of how information literacy arises and develops within society. This must be accompanied by an acknowledgement of its impact on policy making within the university environment or home, and within the individual's experience of a subject, and the construction of knowledge. With this in mind the next section of this paper explores the main areas associated with information literacy, and which need to play a central role in any information literacy provision.

The Research Process

We must introduce students to the research process, and the current move in education from content to process must continue by stressing the importance of developing effective research skills. It is often assumed that students already know how to do research but our practice has shown that this is not the case. According to Smith and Hepworth (2005: 46) "students referred to receiving instructions in some of the steps of the research process, but that knowledge was not always applied in their research". It is critical that students understand how to do research and be self-reliant users of the surrounding information environment. But, many students do not actually understand the basic tenets of research, nor do they know how to select the most appropriate resources. Students need to use a systematic research process that includes a broad understanding of information resources and specific skills woven into a recursive process. Research must be learned through repeated practice, with insight and coaching. Librarians involved in the teaching of information literacy, information skills and search strategies must adopt a systematic research approach in their practice in order to enhance the users' appreciation of this process. Many librarians may be teaching students the tools of research without teaching them the bigger picture. Our students need to see the big picture in order to understand how their competences can be used as tools to collect evidence as well as information. While it is important to locate an item, it is more important to know what to look for. There is a need for a change in the way we regard information, and the fundamental concern for librarians ought to be with the implementation of information literacy within specific learning outcomes, rather than limiting their professional concern with the access and supply of information.

Writing and Publishing Processes

Writing activities are essential for acquiring information literacy and could lead to an enrichment of the conceptions of the term, although we have to remember that "information literacy is less a formal skill linked to textual features than an intellectual process driven by engaged inquiry" (Noorgaard, 2003: 128). Educators have to incorporate rhetoric and composition into the theory and applications of information literacy. Norgaard states that we would gain a lot by thinking of information literacy as shaped by writing, writing theory, and the writing process itself. The question therefore is whether writing about information literacy would encourage a more active approach and interpretation of this concept. It is our view that this approach leads to a more situated, process-oriented enriched concept relevant to a broad range of rhetorical and intellectual activities. We believe that students must learn not only the mechanics of writing, but must also become proficient in the use of text to communicate knowledge and ideas.

Information-Seeking Process that have influenced information literacy provision

Early traditional paradigms of information-seeking had a tendency to over-simplify this process. For example, in 1977 Robertson presented a model in which the seeker entered a query and was given a matching result, while Dervin (1992) developed a needs-based model called sense-making. and

Taylor (1985) devised a value-added approach for information seeking. David Ellis (1993) presented an information seeking model in which he described the information seeking behaviour of social scientists. His research resulted in a pattern of information-seeking behaviour that included six generic features: starting, chaining, browsing, differentiating, monitoring and extracting. In 1993 Ellis and Cox added another two: verifying and ending. This framework had a profound impact on information-seeking research because it demonstrated patterns across situations and contexts. In 1997 Ellis modified his model by shifting the emphasis from starting to surveying, from differentiating to distinguishing, and by adding the new feature of filtering to the information-seeking process. Other research developed along similar lines, as shown by Kuhlthau's (1991) well cited Information Search Process (ISP) model which identified the following stages of initiation, selection, exploration, formulation, collection, and presentation. Similarly, in 1999 Chu presented a model illustrating the information-seeking process as consisting of idea, preparation, elaboration, analysis, writing and dissemination.

Feelings experienced when applying Information-Seeking Processes

In 1993 Kuhlthau presented in her book *Seeking Meaning* the view that the feelings students experience during information-seeking have substantial impact on the various stages and activities of this process. For example, the initiation phase of information-seeking is characterized by feelings of uncertainty which gives rise to feelings of doubt, confusion and frustration. When the search process proceeds and hopefully turns out to be successful those feelings change into confidence, optimism, relief and satisfaction. These emotional factors have led Kuhlthau to raise the importance of attitudinal behaviours towards information seeking.

Our model is based on the process of information seeking proposed by Ellis, and complemented by the additional principles of the research process, the principles of writing and publishing, as well as the impact of the feelings experienced by learners involved in these processes advocated by Kuhlthau. This in our view provides a more holistic and profound definition of information literacy (Fig. 1).

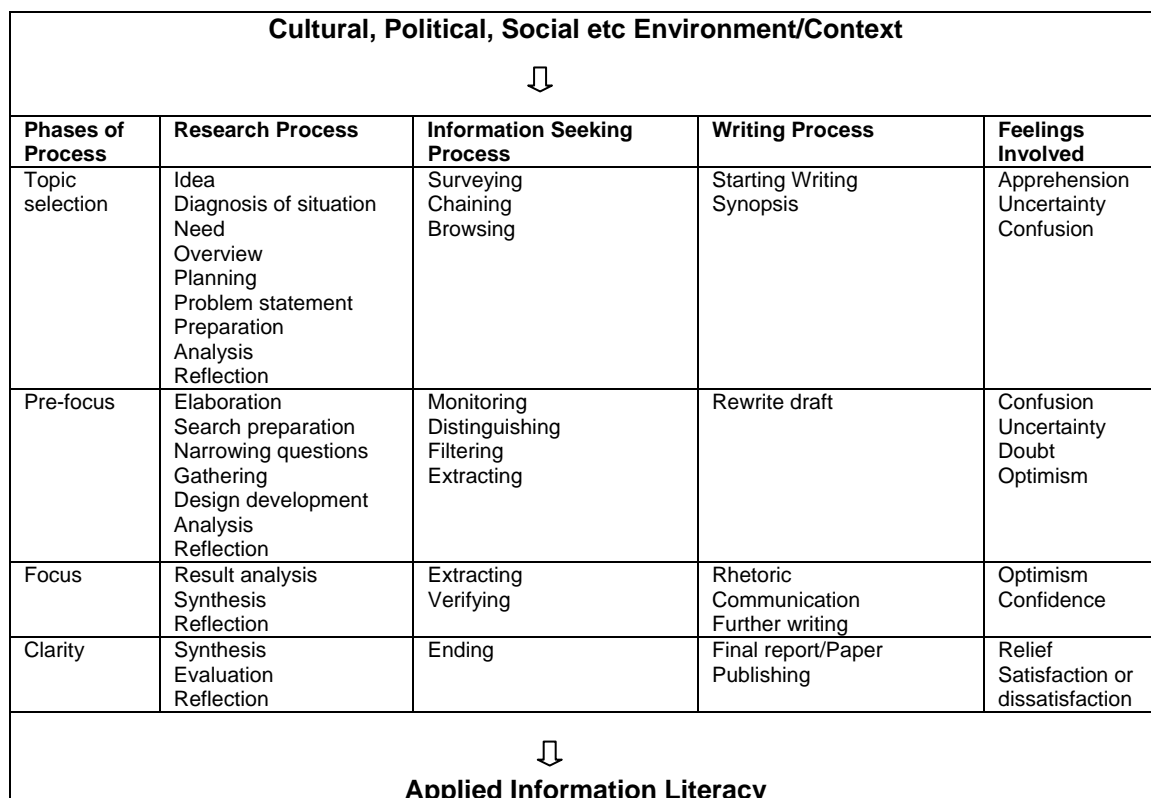


Fig. 1 Simultaneous Processes Involved in Information Literacy

This model, which was initially used as a framework to map the main areas of information literacy provision, gradually grew into a new model of Applied Information Literacy (Fig. 2) and presents a full sequence of activities which lead to the development of applied information literacy competences.

From this point of departure we believe that Applied Information Literacy can be described as an action research approach comprising several simultaneous processes. At the beginning of the research activities, students start with only a preliminary design which is then changed or developed during the process to be able to solve the research problem/question as successfully as possible (Lantz, 1999). Action research provides a reasonable and promising way to conceptualise Applied Information Literacy that could improve student achievement and enhance the overall educational practice. The action research perspective provides a systematic approach and encourages reflective decision-making through the different phases of information seeking and use.

The processes in Fig. 2 are complementary to one another and the relationships are represented graphically. The cycle-like dynamic character of the model reflects the totality of the processes involved leading to Applied Information Literacy.

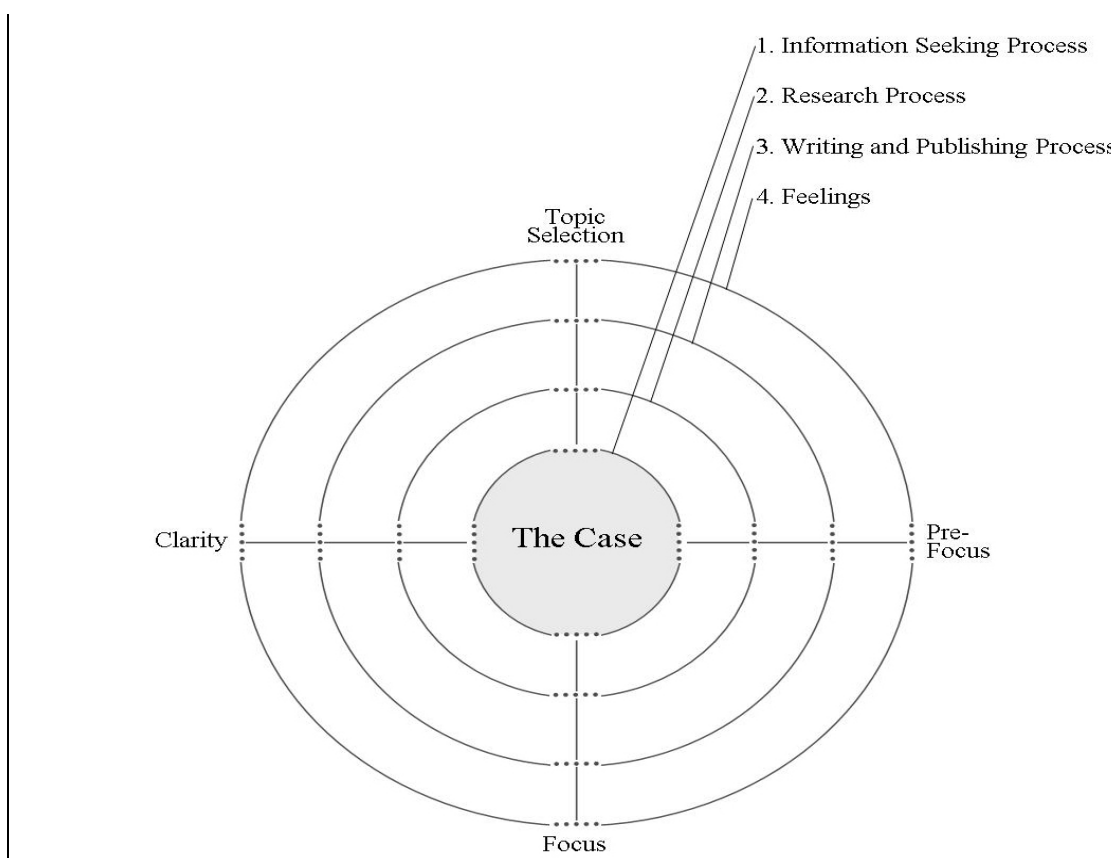


Fig. 2. A Graphical Illustration of the Simultaneous Processes Involved in Information Literacy³

Discussion: Some of the Challenges Ahead

The overall challenge is to produce a generation of information literate and lifelong learners who can succeed in the information age. In order to accomplish this we need to closely examine our own expectations and assumptions of what students need to learn and how we can contribute effectively to that learning. The challenge here is to ensure that library and faculty staff fulfil their information literacy roles. In order for students to formulate their own arguments, they must organize, access, and unpack their sources. It is vital that they can identify clearly the perspectives covered by their research questions and can explore both sides of an argument. But how do we develop their awareness of bias and authority, to distinguish relevant studies from the less relevant, the good

³ We thank Mr Ulf Lindgren for the help with the graphical design of Figure 2.

quality research from the poor quality, and make them understand issues of currency, accuracy, relevance and comprehensiveness? A viable research question produces more than one reasonable answer, hence, the importance of using several sources because they each suggest approaches toward answering the research question. The challenge rests on making students pay enough attention to this important part of the research process so that they can to evaluate, synthesize and organize the information from different sources into an original, logical and cohesive paper. Our practice has shown that students have problems when they must reconcile the different findings from different studies and in presenting the key points arising from these studies. Therefore, we must help students understand how to identify areas of controversy in the literature so that they appreciate the theoretical framework depicted by a range of authors and see the relationship between the theoretical and research perspectives. Reflection is then encouraged by asking questions on how accurate and valid the measurements are.

Students need coaching, not just with identifying and locating information, but also with internalising and making sense of the information gathered. We must foster their focus on the process and help them learn from the content. It is also important to provide time and encouragement for reflection and meta-cognition to occur. (Brage & Lantz, 2004)

We have also noticed that students cannot use online databases to support their research. This problem is compounded by their inability to understand that information seeking is a complex process. As a result, they underestimate the complexities of information seeking, a problem which our model of Applied Information Literacy aims to address by emphasising the role of the context for information seeking, and above all, by avoiding 'prescriptive' information seeking patterns. Often the information that students select is what looks the most appealing, in other words they choose what seems to communicate itself most effectively and efficiently, and appears reliable and authoritative. But to decode a text and extrapolate its meaning, the students must read at a deeper level and this is often problematic. We address this difficulty by ensuring that students learn to evaluate the information they encounter, and also identify its value in terms of their goals.

It is important that librarians and faculty are resourceful and willing to take risks in order to create new ideas or develop innovative approaches to learning. This is achieved through a systematic, and long-term development that encourages a hands-on approach which is complemented by reflection on theory and practice (Lantz & Brage, 2004). In using the proposed model of Applied Information Literacy we think that we can provide the students with a more holistic picture making them understand all the important tenets of research thus ensuring that they become information literate throughout their lives. Through case-based learning they understand the demands of society and develop appropriate abilities and skills to function in real life conditions beyond their academic studies. The combination of the model and case-based teaching is in our opinion a promising way forward.

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