Information Literacy
A Literature Review

Introduction

This paper will give a short overview of some of the developments in information literacy in different countries and is divided into two parts. The first provides an overview about the concepts used and discussed by different authors. The second highlights information literacy initiatives in selected countries. The overview is based on literature reviews. The article presents a selected overview.

Development of the Concept of Information Literacy

The concept of *information literacy* was first introduced in 1974 by Paul Zurkowski, president of the US Information Industry Association, in a proposal submitted to the *National Commission on Libraries and Information Science* (NCLIS). He recommended that a national program be established to achieve universal information literacy within the next decade. According to Zurkowski: "People trained in the application of information resources to their work can be called information literates**.** They have learned techniques and skills for utilizing the wide range of information tools as well as primary sources in moulding information solutions to their problems" (Behrens, 1994; Bruce, 1997a). In this definition Zurkowski suggested that 1) information resources are applied in a work situation 2) techniques and skills are needed for using information tools and primary sources; and 3) information is used in problem solving (Behrens, 1994: 310). He pointed out that while the population of the United States was nearly 100% literate, only perhaps one-sixth, could be characterized as information literates (Seaman, 2001).

Several authors agree that the information-literacy movement has evolved from precursors such as *library instruction*, *bibliographic instruction* and *user/reader education* (Rader, 1991; Snavely & Cooper, 1997; Bruce, 2000; Seaman, 2001). By the 1930s, the phrases *library orientation* and *library instruction* were commonly used in Anglo-American librarianship to name the activity of teaching library use. *H. W. Wilson,* published since 1921, indexed materials on teaching library use from the period 1930-88 under the heading *instruction in library use* and then *library instruction*. In 1988 the phrase was changed to *bibliographic instruction* and this remains the accepted phrase for the activity of teaching library or information use. *LISA: library and information science abstracts* used *libraries: use instruction* from 1970 to 1992 and in 1993 changed to two headings:

information literacy and *user training* (Peterson, 2001). In 1992 the term *information literacy* was also added as a descriptor to the ERIC Thesaurus (Spitzer et al, 1998). *Library literacy* is usually defined as 'the learning of the basic skills of finding information' (Lubans, 1978) and refers to *competence* in the use of libraries with a particular emphasis on being able to make informed decisions about sources of information. Several authors (Arp, 1990; Rader, 1991; Lenox & Walker, 1992; Rader & Coons, 1992; Miller, 1992; White, 1992; Murdock, 1995); Snavely & Cooper, 1997) have discussed the relations between above-mentioned terms. However, according to Bawden (2001) their conclusions are by no means unanimous.

In 1976 Burchinal refined further information literacy as a *set of skills* and linked information literacy with 1) skills that include *locating* and *using* information 2) the use of information for *problem solving* and *decision making*; and 3) efficient and effective information *location* and *utilization*, Owens (1976) tied information literacy to *democracy* suggesting a connection between *active citizenship* and information literacy**,** Hamelink (1976) used the term to refer to the need for the *general public* and views information literacy as the *ability* to obtain an individual and independent view of news events (Behrens, 1994; Bawden, 2001).

In 1979 *The Information Industry Association* (IIA) defined information literate person as a person who knows the *techniques* and *skills* for using information tools in moulding solutions to problems (Garfield, 1979; Behrens, 1994) and Taylor introduced the term in the library literature (*Library Journal)* suggesting the elements of information literacy and linking librarians while broadening its scope (Taylor, 1979; Behrens, 1994; Spitzer et al, 1998). The definitions of the 1970s highlighted a number of requirements for information literacy, but did not identify the actual knowledge and skills required for information finding and use. However, information literacy was also seen as something serving the functions of citizenship. Behrens points out that definitions of the 1970s were developed in response to the rapidly increasing amount of information available and to cope with information overload (Behrens, 1994; Spitzer et al, 1998).

Throughout the 1980s, librarians, communication experts and educators contributed to the development of the definition. Two sets of definitions and standards were developed in K-12 education and higher education. *A Nation at Risk,* published in 1983 by the *National Commission on Excellence in Education* marked the development of information literacy in K-12 education. In response to that, the *U. S. National Commission on Library and Information Science* (NCLIS) members agreed that a concept paper should be written to define what is meant by information

skills. As a result, *Educating Students to Think: the Role of the School Library Media Program* was published in 1986 by Mancall, Aaron & Walker (Spitzer et al, 1998). Kulthau's *Information Skills for an Information Society: A Review of Research* (1987) included *library skills* and *computer skills* in the definition and contributed to the development showing that information literacy is not a discrete set of skills, but rather *a way of learning* (Kuhlthau, 1987; Behrens, 1994; Spitzer et al, 1998). The *Big Six Skills Approach*, developed by Eisenberg & Berkowitz (1988), was a parallel development for K-12. They emphasized the importance of using *information problem-solving skills* across situations and their model gave students a systematic framework for solving information problems (Spitzer et al, 1998). Seaman (2001) notes that though the phrase *information literacy* does not appear as a fundamental concept of the Big Six Skills', the identified components of information literacy were incorporated into this approach. Their model stresses the idea of integrating library instruction into a school's curriculum, rather than treating library instruction as a stand-alone instructional unit, taught in an instructional void (Seaman, 2001).

In higher education settings a definition created by Martin Tessmer for the *Auraria Library at the Denver campus of the University of Colorado* (1985) states: "information literacy is the *ability* to effectively *access* and *evaluate* information for a given need". It gave a list of skills required as characteristics of information literacy. Demo (1986) and Behrens (1994) regarded the formulation of this definition as being particularly significant and Behrens highlighted a number of important aspects of this definition: a) an *integrated set of skills* is included as one of the characteristics of information literacy. These skills are defined *as research strategy* and *evaluation* b) information literacy extends beyond mere locating of information to include *understanding* and *evaluating* the information c) the library is not the only source of information d) information literacy requires particular attitude, such as the *awareness* of a need for information and the accurate *application* of the information (Demo, 1986; Behrens, 1994).

The Carnegie Foundation Report titled *College (*1986), a symposium *Libraries and the Search for Academic Excellence* (1987), accreditation agencies as the *Western Association of Schools and Colleges* (WASC), the *Commission of Higher Education (CHE) Middle States Association of Colleges and Schools*, and groups as the *American Association of Higher Education* (AAHE), the *National Education Association* (NEA), the *Association for Supervision and Curriculum Development* (ASCD), and the *National Council for the Social Studies* (NCSS) have been influential in elevating the importance of information literacy in higher education (Spitzer et al, 1998). The *American Association of School Librarians'* (AASL) publication *Information Power:*

*Guidelines for School Library Media Programs (*1988) and Stripling & Pitt's *Brainstorms and Blueprints* (1988) contributed also to the development of information literacy (Spitzer et al, 1998; Seaman, 2001). These developments in education ensured a shift away from library-centric instruction toward a more global focus emphasizing lifelong information literacy skills. As the definitions, standards, implementation and research developed separately in K-12 and higher education settings, there appears to be little overlap or cross-fertilization (Seaman, 2001).

The seminal event in the development of the concept of information literacy was the establishment of *the American Library Association (ALA) Presidential Committee on Information Literacy* and *the National Forum on Information Literacy*, a coalition of more than 65 national organizations, in 1987. This group including leaders in the field of education and librararianship wanted to show that literacy could no longer be considered merely to be the ability to read and memorize a base of knowledge; instead, literacy must entail the ability to acquire and evaluate the information that is needed in any situation (Pettersson, 2000). A report issued in 1989 provided a capstone for information-literacy efforts emphasizing the importance of achieving information literacy and stressed that it could be achieved only by means of a *new model of resource-based learning* (Behrens, 1994). The report, widely distributed and discussed, resulted in a definition of information literacy that is the most widely accepted in higher education circles: "*To be information literate, a person must be able to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information"* (Spitzer et al, 1998). The report stressed that students should be competent in six general areas: a) recognising a need for information b) identifying what information would address a particular problem c) finding the needed information d) evaluating the information found e) organising the information f) using the information effectively in address the specific problem (ALA, 1989). It also viewed information literacy in lifelong learning context: "Producing such a citizenry will require that schools and colleges appreciate and integrate the concept of information literacy into their learning programs and that they play a leadership role in equipping individuals and institutions to take advantage of the opportunities inherent within the information society. Ultimately, information literate people are those who have learned how to learn. They know how to learn because they know how knowledge is organized, how to find information, and how to use information in such a way that others can learn from them. They are people prepared for lifelong learning, because they can always find the information needed for any task or decision at hand" (ALA, 1989: 3). Spitzer et al (1998) notes that the ALA definition of information literacy formed the basis for the expansion of the concept.

According to Behrens (1994: 316-17) definitions during the 1980s added the following scope to information literacy:

- It has to be taken into consideration with regard to the manner in which they can assist information handling, and the skills which are required for their use.
- Particular attitudes, such as the awareness of a need for information, a willingness to locate and use information, the appreciation of the value of information, and the accurate application of the information, are required.
- Higher order critical thinking skills such as understanding and evaluating information are necessary; mere location of information is insufficient.
- Although libraries are regarded as major repositories of information sources, they should not be seen as the only resources.
- Library skills are not sufficient for complete information literacy; neither are computer skills.
- User education programs require a paradigm shift in order to accommodate the full range of skills required for information literacy.
- In an information society, information literacy could be seen as an extension of the literacy realm
- Information literacy is a prerequisite for active, responsible citizenship.
- The goal of information literacy is the attainment of lifelong skills which enable the person to be an independent learner in all spheres of life.
- Information literacy teaching can enhance the attempts at educational reform which aim at producing independent learners.
- The teaching of information literacy is a combined librarianship and educational issue that requires a partnership between the two disciplines.
- In order for information literacy teaching to be effective in the educational sphere, the skills should be taught across the curriculum in a resource-based learning approach.
- Various information skills are required for information literacy: a) knowing when there is a need for information; b) identifying the information needed in order to address a problem; c) finding the needed information; d) evaluating the located information; e) organizing the information; f) using the information effectively to address the problem (Behrens, 1994: 316-17).

Demo also noted that the meaning of information literacy could be explained from different perspectives, depending on whether librarians, educators, or communication experts define the term (Demo, 1986; Spitzer et al, 1998). Various information literacy process models (also referred to as *information seeking and using process models*) were also developed: information skills model (Marland, 1981; Irving, 1986); information seeking process model (Wilson, 1981); sense-making approach to information seeking (Dervin, 1983); behavioral model for information retrieval system design (Ellis, 1989) (in Cheuk, 1998).

According to Behrens, by the end of the 1980s, information literacy was no longer an embryonic concept. It had been defined with clarity, and its realm comprehensively delineated by the identification of the actual skills and knowledge that are required for information handling in an information-permeated, technologically advanced society (Behrens, 1994). Spitzer et al conclude: "As a result of these developments, in 1989 the process of defining and refining the term seemed at an end (Spitzer et al, 1998).

By the start of 1990s, the meaning of information literacy as proposed by the ALA was generally accepted. Information literacy was being considered as part of the wider literacy continuum. Many higher education institutions formed campus wide committees to work toward including information literacy as a graduation outcome and several groups and individuals explored information literacy (Behrens, 1994; Spitzer et al, 1998).

Several attempts were made during 1990s to develop the definition further. Rader extends the definition adding that information-literate people know how to be lifelong learners in an information society and becoming information literate is essential for survival in the future. She stress that information literate citizens will be prepared to acquire and use information appropriate for any situation, within or beyond the library, locally and globally (Rader, 1990; 1991).

Doyle, as a result of her Delphi study conducted in the early 1990s created the following definition: "information literacy is the *ability* to to access, evaluate, and use information from a variety of sources" (Doyle, 1992: 2), and defines information literacy in terms of *attributes of a person*: a) recognizes that accurate and complete information is the basis for intelligent decision making b) recognizes the need for information c) formulates questions based on information needs d) identifies potential sources of information e) develops successful search strategies f) accesses sources of information including computer-based and other technologies g) evaluates information

h) organizes information for practical application i) integrates new information into an existing body of knowledge h) uses information in critical thinking and problem solving (Doyle, 1992; Spitzer et al, 1998; Langford, 1998).

Shapiro & Huges defined information literacy as a new liberal art that extends from knowing how to use computers and access information to critical reflection on the nature of information itself, its technical infrastructure, and its social, cultural and even philosophical context and impact (Shapiro & Huges, 1996).

In 1997 Bruce offered a new approach to researching and defining information literacy. Bruce emphasized the importance of understanding the way the concept of information literacy is conceived by information users themselves. She suggested a *relational model* for information literacy to accompany the *behavioral models*, which she believed, dominated this field of research. The approach she used for her research was phenomenography. She developed seven conceptions of information literacy among her sample of higher educators. According to her definition, information literacy is: 1) the use of information technology; 2) the use of information sources; 3) executing a process; 4) controlling information for retrieval; 5) gaining knowledge; 6) extending knowledge; and 7) gaining wisdom (Bruce, 1997a; 1997b).

From the work of Doyle (1994) and Bruce (1994) it can be concluded that an information literate person combines the following qualities and abilities: 1) has values which promote information use 2) has knowledge of the world of information 3) recognises that accurate information is a basis for intelligent decision making 4) recognises the need for information 5) formulates questions based on that need 6) identifies potential and appropriate sources of information 7) develops successful search strategies 8) accesses a wide range of sources of information including computer-based and other technologies 9) evaluates information during all phases of information problem solving 10) organises information for practical application 11) integrates new information into an existing body of knowledge 12) uses critical thinking in information problem solving 13) approaches information problem solving in a dynamic and reflective manner 14) engages in independent, self directed learning 15) considers the information needs of others when communicating (Doyle, 1994, Bruce, 1994; Spitzer et al, 1998). Several models of information literacy were proposed also in 1990s: information problem-solving model (Eisenberg & Berkowitz, 1990); information metacourse (Bjorner, 1991); information seeking process model (Kuhlthau, 1993); information seeking model

in the workplace (Leckie et al., 1996), model of information process for PhD history students (Cole, 1997); library research heuristic model (Ury et al., 1997) (in Cheuk, 1998).

Snavely & Cooper (1997) conclude that, despite remaining substantial disagreement about the term, which largely relate to the 'broader and more extraneous elements that have been added to the definition, it is possible to discern a measure of agreement that it can be used to describe *new trends in library instruction*. Specifically, these include: a) independent learning, with students able to undertake all steps of the ALA definition b) ability to apply these principles throughout a lifetime c) instruction in a wider variety of information resources (print as well as electronic) d) shift from strictly content-based instruction on particular resources to a process-based and user-focused approach e) faculty collaboration f) association with new instructional techniques, such as active learning and critical thinking' (Snavely & Cooper, 1997; Bawden, 2001).

The main discussions about the concept of information literacy have been initiated in the United States. However, several European scholars have also discussed the concepts of information literacy and information skills. For example, the relationship between user education and information skills is discussed by Fjällbrant and Malley. They wrote:

> Those involved in this development [user education for schoolchildren] (not all of the work is new) describe the work as 'information skills' (again not new). And although adding new terminology (or reinterpreting old terminology) to a subject already burdened with varying and often confusing descriptors must be viewed circumspectly, the use of the term information skills does usefully illuminate the nature of the new emphasis. It is an 'umbrella' term incorporating study skills, learning skills and communication skills, as well as library skills.... Of course there is nothing entirely new in all this - various librarians have argued along some of these lines before. What is new is that the personnel involved in this work have emerged the different backgrounds of teaching, educational research and libraries, bringing with them expertise and specialist knowledge from these different areas. (Fjällbrant & Malley, 1984: 123, Virkus, 2003).

According to Rogers (Rogers, 1994), many authors argued about the term 'information skills' in the United Kingdom in the 1980s. Heather (1984) could find *'no general agreement on the boundaries of information skills'* in her research review. Brake, *et al.* (1985) found the term too vague and confusing. Meek in *Developing resource-based learning: one school's approach* in 1985 seemed to

accept the term but questioned whether there was agreement about what the skills actually were. She proposed that 'information skills' should mean skilled behaviour in respect of understanding as a result of successful interaction with a source of information and if this is so, two things result: skills cannot be taught apart from the context of their operation; we learn to study by studying, and because they are, in the end, indissolubly linked to personal knowledge, there is no set of skills to be 'acquired' as if one stretched out a hand and took them from the environment. Instead, they are developed as part of personal development (Roger, 1994: 2-3). Hopkins (1987) found that there is an unresolved dichotomy and confusion between the notion of information skills as (a) the retrieval and location of information, and (b) the analysis and synthesis of information, and the distinction between the two aspects is not clearly articulated in the literature. However, by the end of the 1980s, two kinds of information skills were identified: the instrumental, which most involved library use, and the cognitive, which researchers considered more important (Virkus, 2003).

According to Rogers (1994: 3-4), in 1989 Heeks identified two distinct views: one sought a greater precision in terminology, the other warned against it. For example, in 1985 Meek argued that loosely defined terms such as information technology, study skills, information retrieval, and library skills should be stringently examined for the assumptions they make about teaching, learning, and literacy. In 1988, Best and others, concluded that the precise meaning of a relationship between study skills, library skills and information skills was an issue in its own right. Agreeing definitions would not only aid the implementation of specific curriculum innovations, but also help schools to clarify their broad educational position. In contrast, Lincoln noted in 1987 that the more skills are broken down into categories, the more fragmented is one's thinking, and the more difficult it is to achieve co-ordination across the school. Again, according to Rogers, in 1991, Howard highlighted the continuing confusion and lack of clarity about the term 'information skills' in the UK (Virkus, 2003).

During recent years discussions about the terms information literacy and information skills, and the nature of the concepts have intensified again in the UK. There are different approaches in using terms 'information literacy' and 'information skills' and many definitions have been suggested by several organisations, institutions and authors (Virkus, 2003).

For example, the broadly-based definition of information skills in higher education of the Standing Conference of National and University Libraries (SCONUL) Information Skills Task Force (now the SCONUL Advisory Committee on Information Literacy (Alvestrand, 2003)) reflects the twin dimensions of the 'competent information user' at the base level and

the 'information-literate person'. For the latter level of information skills, the term 'information literacy' is used. Therefore, both information skills and information technology (IT) skills are seen as essential parts of the wider concept of information literacy. For the development of the information-literate person SCONUL proposes seven sets of skills. The outline model of information skills generated in the briefing paper has become known as the *Seven Pillars Model*. The pillars show an iterative process whereby information user progress through competency to expertise by practising the skills (Bainton, 2001).

The Chartered Institute of Library and Information Professionals (CILIP) Policy Advisory Groups (PAGs) described information literacy this way:

> We have adopted the commonly accepted distinction between information literacy and skills. Information literacy is about providing all members of society with the information competences necessary to function effectively within society - it might be termed functional information literacy. The debate over information skills relates to the higher level competences of information specialists' (PAG, 2001: 15; Muir & Oppenheim, 2001).

They define 'information literacy *'as a set of basic competencies that should be used by everyone.'* However, the latest definition of CILIP is describing information literacy in the following way:

> Information literacy is knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner (CILIP, 2005).

Researchers of the UK's Joint Information Systems Committee (JISC) funded 'The Big Blue' project, led by the Manchester Metropolitan University and the University of Leeds, find that in many instances both terms are used to describe what is essentially the same concept: 'information literacy' and 'information skills' can be described as synonyms (The Big Blue, 2002). Stubbings & Brine (2003) also note that at Loughborough University the phrases information literacy and information skills are both used to convey the same meaning. The *Glossary of Information Terms* at the British Open University (OU) Library site seems to support the same approach giving the following definition of information literacy: 'a skill that involves being able to use information successfully, including finding information, searching using various tools (e.g., internet, databases) and being able to critically evaluate the results (OU, 2003, Virkus, 2003).

Mutch (1996) is concerned that the term 'information literacy' carries overtones of a very tightly defined skill or competence rather than the broader and more complex set of attitudes, approaches and skills which is hinted at above and that there might be a danger that literacy is related very tightly to text and hence back to a view of information as a thing. He suggests that information literacy needs a definition of information which recognises that it is not structured data, nor restricted to the printed word and to formal sources, and needs to include insights from varied disciplines. He rather sees the value of the concept of information literacy as a strategic concept (Mutch, 1996; 1997; Bawden, 2001, Virkus, 2003).

Webber & Johnston define information literacy as an efficient and ethical information behaviour:

> ...information literacy is the adoption of appropriate information behaviour to obtain, through whatever channel or medium, information well fitted to information needs, together with critical awareness of the importance of wise and ethical use of information in society. (Webber & Johnston, 2002)

Hepworth (Hepworth, 2000b, 2000c) highlights two main approaches to information literacy that are evident: the most common tries to identify discrete skills and attitudes that can be learnt and measured and highlights works of Doyle (1992), the Information Literacy Competency Standards for Higher Education (ACRL, 2000) and the SCONUL approach (SCONUL, 1999). The other emphasis the information literate mindset associated with how an individual experiences and makes sense of his/her world, the work of Bruce illustrates this approach. This analysis seems to reflect to some extent the approaches identified by Bruce (1997) and is described as the behavioural, constructivist and relational approaches to information literacy (Virkus, 2003).

Boekhorst (2003), from the Netherlands, finds that all definitions and descriptions of information literacy presented over the years can be summarized in three concepts:

- The ICT concept: Information literacy refers to the competence to use ICT to retrieve and disseminate information.
- The information (re)sources concept: information literacy refers to the competence to find and use information independently or with the aid of intermediaries.
- The information process concept: information literacy refers to the process of recognizing information need, retrieving, evaluating, using and disseminating of information to acquire or extend knowledge. This concept includes both the ICT and the information (re)sources

> concept and persons are considered as information systems that retrieve, evaluate, process and disseminate information to make decisions to survive, for self-actualisation and development (Virkus, 2003).

He also sees the process of becoming information literate as a lifelong endeavour that should be started at primary school and be a part of formal training in all phases and all subject areas during the whole education process and suggests the consideration of information literacy/illiteracy in information-rich versus information-poor context (Boekhorst, 2003).

The Norwegian scholars, Audunson & Nordlie (2003) also highlight three main categories of information literacy: they describe *technical* capabilities or what one might call computer literacy; *intellectual* capabilities related to traditional literacy; and *communicative* competency that presupposes technical as well as intellectual capabilities, and at the same time transcends them. For each dimension they also distinguish several levels of competence, from basic competence to super-user competence to in-depth competence and consider information literacy as the sum of different 'literacies' (Virkus, 2003).

Hepworth concludes: 'Gradually we are seeing increasingly detailed descriptions and greater consensus about what is meant by information literacy; however different communities tend to describe the phenomenon in slightly different ways with varying degrees of comprehensiveness' (Hepworth, 2000b: 23).

Bawden, who attempts to relate information literacy to the full context of all the other relevant literacies, argues that the term 'information literacy' has been widely and confusingly used in the literature. A number of other related terms have also been used for the same, or similar, concepts including computer literacy (or information technology literacy, electronic literacy or electronic information literacy); library literacy; media literacy (or 'mediacy'); network literacy (or Internet literacy or hyper-literacy); digital literacy (digital information literacy); informacy (Bawden, 2001, Virkus, 2003).

Bawden and Robinson also find it helpful to distinguish between 'skills-based literacies', such as computer or library literacy, which essentially indicate a competence in handling information in a particular setting or context or format, and more general capabilities. These wider conceptions of information literacy stress capabilities beyond a simple competence in retrieving or communicating information. They highlight that to deal with the complexities of the current information

environment, a complex and broad form of literacy is required. It must subsume all the skill-based literacies, but cannot be restricted to them, nor can it be restricted to any particular technology or set of technologies, and understanding, meaning and context must be central to it (Bawden, 2001; Bawden & Robinson, 2001, Virkus, 2003).

Muir & Oppenheim, following the world-wide developments on national information policy, also have to conclude that information literacy 'has no agreed definition' and 'a number of people have offered their views on what they think information literacy is' (Muir & Oppenheim, 2001: 172). In the UK context, a need for an agreed definition of the term 'information literacy', and the need to distinguish it from 'information skills', is highlighted as well (PAG, 2002: 45).

Several other terms and combinations of terms have been also used by different authors: 'infoliteracy', 'informacy', 'information empowerment' 'information competence', 'information competency', 'information competencies', 'information literacy skills', 'information literacy and skills', 'skills of information literacy', 'information literacy competence', 'information literacy competencies', 'information competence skills', 'information handling skills', 'information problem solving', 'information problem solving skills', 'information fluency', 'information mediacy' and even 'information mastery' was proposed by Bill Nisen, Director of the e-Institute of the Strathclyde/Glasgow University, during the first conference on Information Technology and Information Literacy in Glasgow in 2002. Finnish researcher Reijo Savolainen suggests the umbrella term 'information-related competences' that covers information literacy, media competence and library skills and adds: 'Because new labels describing specific kinds of literacies are continually introduced, reflecting the developments of ICTs, the attempts to develop an exact classification of information-related literacies seem to be futile' (Savolainen, 2002). However, despite of the continuous concern about the term since 1990s, information literacy is still the most commonly used phrase to describe the concept (Bawden, 2001, Virkus, 2003).

In several countries the terms used for information literacy clearly refer to competencies. For example, in Denmark the term *informationskompetence*, in Finland *informaatiokompetenssi* (also *informaatiolukutaito*), in Germany *informationskompetenz*, in Norway *informasjonskompetanse* and in Sweden *informationskompetens* have been used for information literacy (Virkus, 2003).

Therefore, the definition and understanding of the concept seems to be related to the way in which the concepts of competence and skills are defined and perceived. The concept of competence also

has different meanings and it is not always clear whether competence refers to identifiable skills, or is it related to patterns of behaviour. *The New Oxford Dictionary of English* defines: 'competence (also competency) - the ability to do something successfully or efficiently; the scope of a person's or group's knowledge or ability; a skill or ability'. The term skill is defined as a person's 'ability to do something well' and also as 'an expertise' (NODE, 2001). It seems that there is no difference between competence and skill and the terms are described as synonyms. Savolainen (2002: 212) points out that there are several other concepts closely related to them and belonging to the same family of concepts: 'ability', 'capacity', 'expertise' and 'know-how' and it can be difficult to find out whether these form a conceptual hierarchy or whether they reside at the same level of generality. Finnish researchers Anttiroiko, *et al.* (2001) refer to competing research approaches to the phenomena of competence. Rationalistic theories approach competence as a set of relatively stable attributes possessed by actors or the set of requirements characteristic of specific work. In contrast, the interpretative approaches emphasize the importance of the ways in which actors experience the settings of action and construct meanings concerning action. The categorization of information literacy approaches by Hepworth (2000b; 2000c), cited earlier, also seems to fit into this framework (Virkus, 2003). However, Finnish researchers conclude that competence has two dimensions - knowledge and skills.

> Knowledge may be seen as our understanding of how our everyday world is constituted and how it works. Skills involve the ability to pragmatically apply, consciously or even unconsciously, our knowledge in practical settings. In this setting, 'skills' can be conceived as the technical aspects of competence, emphasizing the aspect of 'how to do'. (Anttiroiko, *et al.*, 2001: 31).

Several European scholars, mainly outside the library and information science (LIS) discipline, however, approach competence as a quite complicated phenomenon and also distinguish between competence and competency (Keen, 1992; Cheetham & Chivers, 1996, 1998, 2000; Kirschner, *et al.*, 1997; Koper, 2000, Virkus, 2003).

Keen (1992), for example, notes that competencies refer to the ability to operate in ill-defined and ever-changing environments, to deal with non-routine and abstract work processes, to handle decisions and responsibilities, to work in groups, to understand dynamic systems, and to operate within expanding geographical and time horizons. In other words, competencies are a combination of complex cognitive skills (that encompass problem solving, qualitative reasoning, and higher-order skills such as self-regulation and learning-to-learn), highly integrated knowledge structures

(e.g., mental models), interpersonal skills and social abilities, and attitudes and values. In addition, competencies assume the ability to flexibly coordinate these different aspects of competent behaviour. (Kirschner, 1999, Virkus, 2003).

In a learning environment, according to the researchers of the Dutch Open University, competencies can be construed as the abilities that enable learners to recognize and define new problems in their domain of study and future work as well as to solve these problems. A competency is the ability, within a certain (professional or academic) domain, to make use of already learnt as well as new knowledge and skills across traditional subject areas to adequately solve real-life, poorly-defined problems. These competencies are made up of component knowledge, skills and attitudes (Kirschner, et al., 1997). Rob Koper (2000:10) puts it this way:

> I consider a competency to be the ability to act consciously and responsibly in a specific context. By 'consciously' I mean man's ability to freely choose how to act, and to do so with a certain passion and attitude. The choice is dependent on an assessment of the situation and on specific underlying motives such as interests, values or the need to solve a problem. With 'responsibly' I am referring to people's ability to justify their choices and actions, and explain them to others, without putting it down to circumstances beyond their control or automatic behaviour, but rather to their own, carefully considered values and choices. In using these terms I wish to clarify that I view a competency as the combination of cognitive, conative and affective aspects that collectively determine behaviour in a given situation. Which competencies are involved always depends on the domain and the contexts within that domain. And he concludes that there is, as yet, no conceptual framework that is widely accepted in this area (Koper, 2000: 38).

Many publications, however, do not adequately define the exact nature of the concept to which they are referring. Different terms are also used interchangeably and it is not always clear what different authors mean by the terms 'competence' and 'skill'. For example, if the terms competence and skill are defined as synonyms, as well as information literacy and information skills, and information literacy is defined as 'a set of competencies' then it is not always easy to understand the meaning of phrases such as 'information competence skills' 'information literacy skills', 'skills of information literacy', 'information literacy and skills' or 'information literacy competence/competencies' used by the same authors. Savolainen (2002) points out that concepts such as 'competence' and 'skill' are taken as given and most researchers seem to assume that the

meanings of these concepts are self-explanatory or sufficiently well-known from everyday contexts (Virkus, 2003).

In the UK context the report *Work Skills in Britain 1986-2001* also notes:

> Despite the enormous interest in how skills in Britain have changed over time, how they are distributed, and how these trends and patterns compare with competing nations, there is surprisingly little agreement on what 'skills' actually refer to. In practice, different authors often refer to different aspects of skill and they are influenced by the theoretical standpoint (economic, sociological or psychological point of view) from which their interest in the phenomenon stems. (Felstead *et al.*, 2002).

Part of the problem, pointed out by Cheuk (2000), a researcher from Singapore, not from Europe, is also that the term 'information literacy' is made up of two problematic words - 'information' and 'literacy' which also has no agreed meaning. 'Information' has been defined in several distinct ways and recent definitions of literacy have extended the traditional view of the term to include comprehending the meaning of the words that we read or write. For example, the International Adult Literacy Survey (IALS) defines literacy in terms of proficiency levels of the use of information to function in society and in the economy. Literacy is defined as a particular capacity and mode of behaviour, the ability to understand and employ printed information in daily activities, at home, at work and in the community - to achieve one's goals, and to develop one's knowledge and potential (OECD/Statistics Canada, 2000:12). In IALS literacy is measured operationally in terms of the three domains: prose literacy, document literacy and quantitative literacy. Five levels of literacy are defined:

- Level 1 indicates persons with very poor skills, where the individual may, for example, be unable to determine the correct amount of medicine to give a child from information printed on the package.
- Level 2 respondents can deal only with material that is simple, clearly laid out, and in which the tasks involved are not too complex. It denotes a weak level of skills, but more hidden than Level 1. It identifies people who can read, but test poorly. They may have developed coping skills to manage everyday literacy demands, but their low level of proficiency makes it difficult for them to face novel demands, such as learning new job skills.

- Level 3 is considered a suitable minimum for coping with the demands of everyday life and work in a complex, advanced society. It denotes roughly the skill level required for successful secondary school completion and college entry. Like higher levels, it requires the ability to integrate several sources of information and solve more complex problems.
- Level 4 and 5 describe respondents who demonstrate command of higher-order information processing skills (OECD/Statistics Canada, 2000: xi, Virkus, 2003).

Dramatically, however, according to the report, in all the countries and regions surveyed, at least one of every four adults fails to reach minimum literacy levels for coping with everyday life and work in advanced societies (OECD/Statistics Canada, 2000, Virkus, 2003).

Several observers have expressed concern that putting two fuzzy terms together does not make the overall concept clearer. Others assert that it does not matter what you call or define it, as long as it gets done. However, a leading Australian information literacy promoter, Alan Bundy, notes:

> The more that librarians and their associations can agree on the terminology, definition, standards for, assessment of, and importance of information literacy at a local, national and global level, the greater will be the prospect of their success in elevating the issue over the next 25 years to one of universal concern and better educational and library resourcing (Bundy, 2002).

Virkus, focussing in her research on the higher education sector and, more specifically, on online learning, prefers to use the term 'information-related competencies', as it combines several blocks of competencies related to information handling and use; for example, identifying, locating, gathering, selecting, storing, recording, retrieving and processing information from a variety of sources and media; developing successful information seeking and retrieval strategies; mastering complex and multiple information systems; organizing, analysing, interpreting, evaluating, synthesizing, and using information; and, presenting and communicating information clearly, logically, concisely and accurately. These information-related competencies can be seen as made up of increasingly sophisticated knowledge, skills and attitudes. The author also believes that the constructivist approach to learning has close connections with the process of information-seeking and use. From the 1970s on, research on human cognition as information-processing has revealed the 'constructive' nature of human learning. Learning consists of complex information processing, problem-solving, decision-making in uncertainty and the urge to transfer knowledge and skills into new, unknown settings. Learning is, in this view, defined as an active, constructive, goal-oriented

and situated process that requires intensive mental activity and construction of meaning on the part of the learner (Dillemans *et al.*, 1999). Therefore, to learn constructively involves active seeking, processing and using of information, critical analysis and metacognition. In this context, information-related competencies may be viewed as context- and content-dependent competencies which are integral elements in a constructive learning environment and are closely related with the characteristics of constructive learners (prior knowledge, metacognition, motivation, and the complex variable 'learning style'). However, the term 'information literacy' might be a useful research construct or umbrella term covering information-related competencies and also as a strategic concept or goal - a political, economic and educational one (Virkus, 2003).

In 2002 Bruce, however, concludes ‘The idea of information literacy, emerging with the advent of information technologies in the early 1970s, has grown, taken shape and strengthened to become recognized as the critical literacy for the twenty-first century. Sometimes interpreted as one of a number of literacies, information literacy is also described as the overarching literacy essential for twenty-first century living. Today, information literacy is inextricably associated with information practices and critical thinking in the information and communication technology environment' (Bruce, 2002)

Information Literacy Initiatives

The information literacy movement in the United States (Behrens, 1994; Doyle, 1994; Breivik, 1998; Spitzer, *et al.*, 1998; Seaman, 2001; McCartin & Feid, 2001) and Australia (Bruce & Candy, 2000; Bruce, 2001; CAUL, 2001) is quite extensively analysed and discussed and there have been significant initiatives in these countries. In the United States the National Forum on Information Literacy was established in 1989, the Institute for Information Literacy in 1998, while two sets of information literacy standards were developed for the school sector and the higher education sector. The United States Department of Education included information literacy in its national education technology plan as one of five goals in December 2000. The importance of students being able to access and evaluate information is also highlighted in several other strategic documents (Spitzer, et al., 1998; Riley, *et al.*, 2000; Muir & Oppenheim, 2001; Koch, 2001, Virkus, 2003).

Examples of how information literacy initiatives and standards have been applied in the United States can be found at various levels. At the state level, for example, Colorado, Wisconsin, and Oregon have adopted standards and several initiatives have been developed by state-wide systems of higher education, including SUNY Information Literacy Initiative, the California State

University System Information Competence Project, Wisconsin and the University of Massachusetts. Individual colleges and universities have also implemented standards. Some of these are Earlham College, Kings College, University of Louisville, University of Washington, University of Iowa, and Florida International University (Snavely, 2002; Wilson, 2001, Virkus, 2003).

The concept of information literacy has also permeated strategic thinking in Australia (Muir & Oppenheim, 2001) and has been highlighted in several influential reports produced by the higher education sector and by the government. The Council of Australian University Librarians (CAUL) has developed information literacy standards adapted from the Association of College and Research Libraries (ACRL) ones (CAUL, 2001) and information literacy strategies have been integrated into many university institutional plans. For example, the Central Queensland University (CQU) distance education information literacy programme has been a focus for numerous grants and recognised as a flagship programme internationally, as well as within Australia (Bruce & Candy, 2000), the University of Ballarat's policy documentation identifies information literacy as a key graduate outcome and as an integral part of an undergraduate curriculum model (Radomski, 2000) and the University of Wollongong has reported progress on integration of information literacy into the curriculum (Wright & McGurk, 2000, Virkus, 2003).

From 1992, successful national conferences on information literacy have been conducted every two years by the University of South Australia and the Australian Library and Information Association (ALIA). In 2001 a joint Australian and New Zealand Institute for Information Literacy (ANZIIL) was established (CAUL, 2001) and the ALIA released a *Statement on Information Literacy for all Australians* endorsing the importance of information literacy from a personal, political, economic and global perspective (Bundy, 2002). It should also be mentioned that valuable research related to information literacy is being done in Australia (Virkus, 2003).

There are also references to information literacy developments in Canada, China, Japan, Mexico, Namibia, New Zealand, Singapore and South Africa (Whitehead & Quinlan, 2002; Spitzer, *et al.*, 1998; Muir & Oppenheim, 2001; Rader, 2002a; Inoue, *et al.*, 1997; Morgan, 2000; Moore, 2000; LIANZA, 2001; Hepworth, 2000a; Karelse, 2000, Virkus, 2003).

For example, **in China** the first National Conference on information literacy was held on January 6-8, 2002, at Heilongjiang University in Harbin City. According to Rader (2003) many of concerns and issues are very similar to issues faced by academic librarians in the United States. It was also

mentioned that for more than 20 years Thsinghua University Library has offered a very intensive program of library instruction, including seven required credit courses, reaching more than 2,000 students a year. Library instruction needs are also addressed individually and through distance education. The ACRL Information Literacy Competency Standards were translated by librarians from Tshinghua University into Chinese (Rader, 2003).

In Japan, Inoue et al (1997) have emphasised the need to revise the curriculum and to promote information literacy. They note that information literacy should as equally positioned as "reading, writing, and calculus" to be one of basic endowments of pupils and students who are to live in advanced information society. They also stress the need to establish information morality (Inoue et al, 1997; Muir et al, 2001). Muir et al (2001, p.175-176) note that the definition of information literacy by *the Japanese Ministry of Education* is composed of four elements:

- Capability of judgement (evaluation), selection, organisation, and processing of information as well as of information creation and communication;
- Understanding of characteristics of information society, effects of information over society and human beings;
- Recognition of importance of, and responsibility for information;
- Understanding of foundation of information sciences, learning of basic operation skills of information and information devices (particularly computer) (Muir et al, 2001, p.175-176).

Morgan (2000) notes that **in Mexico** the term information literacy, being an English literal translation, does not express the depth upon it is defined. For aims of a less literal and more practical understanding of the information literacy, it has been described as Development of Informative Abilities (DIA), concept used by *National Meeting of Informative abilities* in *University Autonomous of City Juarez* (UACJ) in 1997 and 1999 which joined hundreds of librarians in Mexico (Morgan, 2000).

Since 1993, **New Zealand** has had a national curriculum framework that pays explicit attention to information skills, together with those of communication and problem solving. According to Moore the framework appears to provide a solid foundation for the development of information literacy throughout compulsory education. However, a survey of New Zealand schools found that the majority of teachers felt a personal need for professional development to meet the information skills demands of the curriculum. Little is known, however, of teachers' strategies for meeting

information needs, or of their understanding of information skills and resource-based learning (Moore, 2000, p.257).

In 1997, a New Zealand *Department of Labour* report also stated that "Government could encourage more people to become "information literate", to gain basic ICT skills, and to pursue tertiary ICT qualifications". Although this emphasises ICT, there is a section in the document that discusses the need for information literacy in the full sense and quoting standard definitions (Muir et al, 2001, p.176).

In February 2001, *the Library and Information Association of New Zealand Aotearoa* (LIANZA) published the document *Towards a National Information Strategy*: *LIANZA/TRW recommendations for a National Information Strategy* which is expected to be a blueprint for creating a knowledge society in New Zealand. LIANZA stress that national information strategy is urgently needed as New Zealand has lacked any coordination or up front planning on how it will encourage/create a knowledge society for its citizens. The basis of the strategy is a three-pronged approach to knowledge:

a) Knowledge access – the infrastructure to access knowledge with telecommunication networks, libraries etc.;
b) knowledge content - the actual content be made available and accessible through an information infrastructure (search tools and databases);
c) knowledge equity – the skills needed to turn information into knowledge - literacy, ICT (basic computing skills) and information literacy skills.

The need for formal recognition of information literacy as an essential skill in a knowledge society was stressed as well (LIANZA, 2001).

LIANZA stress that the public library system should be strengthened to provide equitable access to information to the community whilst school libraries in the education sector can play a similar role in information literacy. LIANZA believes the only way of tackling the causes of the digital divide is by providing good information infrastructure for accessing knowledge, relevant content and information literacy. Information literacy is defined as the ability to access, process and use information effectively. It is stressed that information literacy provides the foundation for and underpins:

a) effective participation in democracy;

b) achievement in all areas and levels of formal education and in life long learning;
c) the development of an innovative, knowledge-based economy and the production of new knowledge;
d) social and cultural inclusion;
e) community and individual empowerment;
f) an individual's capability to manage the challenges of information complexity and information overload (LIANZA, 2001).

The document highlights that the most critical divide will be between those who have the understanding, skills and knowledge to operate effectively in the society and those who do not and this constitutes the Information Literacy Divide. It is emphasized that information literacy should be one of the key elements of a National Information Strategy and the development of a centrally coordinated and cross-sectoral information literacy vision and strategy for New Zealand will complement and strengthen existing government initiatives and strategies and contribute to the achievement of government goals (LIANZA, 2001).

Threats to addressing the information literacy issues are mentioned as follows:

a) a lack of understanding and awareness of the concept of information literacy and its implications;
b) fragmentation of initiatives and interests at all levels nationally;
c) underestimation and under-utilization of the contribution of libraries;
d) absence of policy and strategy frameworks;
e) lack of research, documentation, assessment and evaluation tools;
f) lack of clarity regarding roles and responsibilities;
g) weakness of the overall skills base at all levels of the population;
h) the emphasis by many organizations on how to use a computer and the perception that this is all there is to it (LIANZA, 2001).

The recommendations encourage Government to develop a national information literacy strategy as an integral element in an overall national information policy for New Zealand, championed by one strong central agency. There is also a call to set up interdepartmental forums for the explicit purpose of reaching a common understanding of information literacy and its importance, to emphasize the information literacy aspect in current initiatives and policy work related to ICT, to

recognize the role of libraries (school libraries as well as public libraries) as a crucial element in the necessary information and learning infrastructure for New Zealand, etc. (LIANZA, 2001).

According to Hepworth the Government **in Singapore** have also recognized the importance of information literacy for the longevity of the Singapore economy and a number of initiatives to develop information literacy and skills have been put in place in primary and secondary schools (Hepworth, 2000). According to Muir et al, the Ministry of Education in Singapore has developed some guidelines for information literacy and considers the ability to "seek, process and apply knowledge" as an outcome of the Singaporean education system (Muir et al, 2001, p. 176).

In 1987, seven secondary schools participated in "information skills" library instruction pilot program which led to the publication of an information skills package by *the Languages and Libraries Development Branch, Curriculum Planning Division, Ministry of Education* in 1989. The package was revised in 1991 and become known as the "black book". The "black book" was aimed at secondary schools and included: skimming and scanning; listening skills; taking and making notes; organisation and planning in carrying out a research project; viewing skills; interpreting graphical information; library skills; parts of a book; reading the newspaper; using the dictionary; using the encyclopaedia; reading for different purposes; questioning skills; using information; and presentation skills. Implementation and incorporation of the information skills package into the curriculum was not compulsory, and was left to the discretion of the school and teachers. The "orange book", *Information skills for primary schools,* was published in 1991 as part of the overall library instruction program. Contents of the "orange book" included: how to organise your time; using the encyclopaedia; using the dictionary; using the thesaurus; how to carry out a project (planning, locating print sources, taking notes and organising information); other reference materials (for example, newspapers and telephone directories. According to Hepworth these provided imaginative and practical ways for learning information skills (Hepworth, 2000, p. 54-55).

In 1996, feedback from teachers was published as *Collaborative projects of library support groups in primary schools.* The publication was produced by library coordinators and library teachers, who engaged and shared ideas and materials relating to the library instruction program (Hepworth, 2000, p.55).

Increased emphasis on information literacy and creative thinking by the Government saw the publication of *Information literacy guidelines* and *Information literacy: Supplementary materials* in 1997. According to Hepworth these publications built on the fundamental concept of encouraging reading and moved away from library-based skills. Greater emphasis was placed on information literacy in its broader sense. The need to integrate information literacy into the existing curriculum rather than teaching it in isolation was also recognised. Specific knowledge and skills were identified and guidelines given in terms of what they mean in the primary, secondary and pre-university context and how they can be incorporated into the school curriculum (Hepworth, 2000, p.55).

The extensive reading and information literacy (ERIL) program: Implementation guidelines for secondary schools was published in 1997, which aims to "extend pupils", reading experiences and advance their information literacy skills'. A new position, Head of Media Resource Library and Information Technology, was also created. Over 200 teachers were trained for one week in information literacy and skills and the management of a media resource library by the Division of Information Studies at Nanyang Technological University and the Information Studies Department at Temasek Polytechnic. There is also recognition by Government that the public library can play a key role in the society. Less emphasis has been placed on incorporating changes into the tertiary curriculum (Hepworth, 2000, p.55-56). Hepworth also reports the initiatives in incorporating information literacy into the curriculum at Nanyang Technological University (Hepworth, 2000).

In the **South Africa** *the Centre for Educational Technology and Distance Education,* part of *the Department of Education* (NCETDE), has published a policy document for school libraries. This report stated that the NCETDE should articulate national policy for school libraries, library-based resources, teacher-librarians and pre-service and in-service educator development, within the framework of the Constitution of South Africa and outcomes-based education. The policy should clearly state the relationship between outcomes-based education, learning resources and the school library. This will support the integration of information literacy teaching and library use in the outcomes-based curriculum for all learning areas and in all grades (Muir et al, 2001, p. 176-177).

There has been a lot of activity also in the higher education sector. *The Cape Library Cooperative* (CALICO) is behind the INFOLIT project, which was initially funded by the *Readers Digest*. The aim of INFOLIT was to promote information literacy in the five South African higher education institutions. INFOLIT promotes information literacy primarily within the tertiary sector, but also

among schools and communities (Karelse, 2000). The University of the Orange Free State also runs information literacy course (Muir et al, 2001, p. 177).

Celia Walter, reference librarian from the University of Cape Town gave a very well received paper *Beyond the segregated highway* which reviewed South Africa as a society undergoing great transformation in the face of the many fundamental challenges facing its reconstruction and development program (RDP). In the paper is described the outcomes of the May 1996 *Information society and development conference* (ISAD); the new schools curriculum framework which has been entitled *Curriculum 2005* and which has as one of its aims 'helping learners to become lifelong learners'; and the fact that, for the first time, South Africa will have a national system of education and training aimed at benefiting the whole country and all its people, ending the discriminatory apartheid system with its fifteen departments of education. *Curriculum 2005* has been strongly influenced by New Zealand's outcomes based system and it has not been without criticism. Walter also reviews the South African green paper on higher education transformation, and the information literacy implications, including the concerns of the working group on libraries and information technology.

South Africa has been more active in the information literacy area than many other regions. For example, of considerable interest in Walter's paper is an outline of the Cape Libraries Cooperative (CALICO) information literacy project INFOLIT which commenced in 1995 to provide undergraduate students, particularly those from disadvantaged backgrounds, with enhanced information literacy. The challenges she describes as facing the CALICO librarians are recognisable to all academic librarians (Bundy, 1998).

Academic libraries have played an important role in information literacy developments **in Europe**. Information literacy initiatives in higher education have taken a variety of forms: stand-alone courses or classes, Web-based tutorials, course-related instruction, or course-integrated instruction. Most authors seem to agree that information literacy should be integrated into subject areas (Kemp, 1999; Joint & Kemp, 2000; Rafste, 2002; Town, 2002). Webber & Johnston (2000) differ from many other authors by advocating that information literacy can be treated as a discipline of study in its own right, rather than favouring the curriculum integration model. There is also a shift towards increasing emphasis on faculty-librarian partnership and implementation of modern ICTs in delivering information literacy courses. There is a considerable experimentation with using ICTs in European higher education institutions in general, sometimes to improve the on-campus learning experience, at other times to deliver distance learning. The general picture is that in most cases

institutions are now transferring from a period of rich and mostly bottom-up experimentation to a phase in which institution-wide use of ICT is being encouraged (Collis & Van der Wende, 2002). While the new ICTs are having a variety of direct effects on teaching and learning in universities, there are also a number of other important factors having major influences on higher education. The processes in implementing the Bologna Declaration are having an impact on the development of curriculum structures and quality control attitudes and procedures. The rise in lifelong learning and widening of access to higher education bring in new learners with different previous educational experiences (Virkus, 2003).

In this context, there is also evidence of efforts to develop new teaching and learning methods that emphasise and support students to learn constructively, and to construct their knowledge using information wisely. Several information literacy experiments and examples of good practice should be highlighted in European countries.

In the UK context, the conference on Information Technology and Information Literacy in Glasgow, March 20-22, 2002 demonstrated several examples of good practice. For example, the British Open University, Edge Hill College of Higher Education, Cardiff University, Cranfield University, University College Northampton and the University of Sheffield have developed interesting information literacy programmes. Many programmes are based on the SCONUL model. (SCONUL, 1999, Virkus, 2003).

Examples of good practice identified by 'The Big Blue' project included, for example, Southport College, where an internally accredited information skills module is compulsory for all first year students, South Bank University which demonstrates practical applications of learning outcomes and the impact they have on information skills training, and the University of Aberdeen where pre- and post- self-assessment has been carried out to encourage students to track their progress and see the value of attending information skills training. South Bank University Library has also developed a benchmarking scheme for undergraduate students. Numerous other initiatives are also taking place and there are traditional and online courses and tutorials on information literacy at many universities: the Robert Gordon University, the University of Bristol, the London School of Economics, the University of Nottingham, the University of Bradford, Aston University, Coventry University, etc. (The Big Blue, 2002, Virkus, 2003).

A trend that has also gained popularity in the UK is an interactive Web-based information literacy tutorial, which is designed to introduce students to information literacy concepts and information

resources. However, the University of Leeds briefly experimented with computer-assisted library instruction as early as the end of the 1970s (Fjällbrant & Malley, 1984, Virkus, 2003).

At the British Open University (OU) considerable work has been done to explore the use of technology for delivering information literacy in distance learning programmes and several models have been tested. For example, Safari is the OU Library's information skills tutorial, an interactive, Web-based teaching package for students, tutors, and staff, launched in January 2001. Safari can be used by in a variety of ways - as a training package, working through each of the seven sections in order, or by dipping in to specific topics of interest. Mosaic is another twelve-week online course, offered by the Library in conjunction with the Faculty of Education and Language Studies, which attracts 10 credit points. A team of study advisors provide support via the phone, email and learning management system (FirstClass). Students have the opportunity to work through a teaching package to develop information skills, which will be assessed via coursework or the production of a literature review. The SCONUL Task Force on Information Skills (now SCONUL Advisory Committee on Information Literacy (Alvestrand, 2003)) has acted as critical reader for the course. Introducing Teaching and Learning Online (ITLO) from the OU's Institute of Educational Technology is a programme designed to support OU staff in the development of online teaching and learning. The Website consists of a series of online interactive activities aimed at helping course teams to make decisions about aspects of online teaching. The information literacy section, to which the unit contributes, provides background information about information literacy, and deals with key questions about information literacy to help teams decide what aspects should be included in their course. The OU approach may be described as integration with the UK key skills initiatives and it is designed as a complement for study programmes or as a stand-alone course (Dillon, et al., 2002; OU, 2003, Virkus, 2003).

Hepworth (2000b) also confirms that Web-based guides such as guides to literature searching are increasingly common. Stubbings & Brine (2003) analysed forty-seven electronic information literacy packages in the UK and divided these into three types: virtual tours (four); OPAC tutorials (nine) and information skills tutorials (twenty-eight). There were two packages being used by more than one institution and seven tutorials required passwords and as such could not be accessed. Of the 21 information literacy tutorials reviewed, four were subject specific with the remaining being generic in nature. The content as well as instructional design principles varied to a great extent and didn't refer always to sound pedagogy. Sometimes tutorials were also too text-based, lacking sufficient interactivity to create adequate active learning experiences. However, Rutter & Matthews

(2002), reporting their experiences in developing 'InfoSkills', Bournemouth University's Web-based library tutorial, refer to the sound pedagogic and generic basis of InfoSkills that has enabled it to be seen by others outside the university as something that could be adapted for their own usage. They also highlight the self-learning principle of the tutorial allowing continuing reinforcement when required for specific user groups, such as international or late registration students (Virkus, 2003).

Several **Scottish** universities have also developed extensive information literacy programmes. Rader (2002a) also refers to some information literacy activities at several academic institutions in **Ireland**. However, in-depth interviews with lecturers from social science faculties in five Irish universities indicated that information literacy holds a relatively insignificant place in academia (Virkus, 2003).

In the Nordic countries **Sweden** seems to be at the forefront of information literacy developments. During the past two decades, Chalmers University of Technology has developed comprehensive information literacy programmes. For example, Fjällbrant and her colleagues were targeting information literacy goals as they are understood today already in 1980s. Their subjects, designed to introduce postgraduate students and researchers to electronic and other information networks, continue to be regarded as a model (Fjällbrant, 1988; Bruce & Candy, 2000; Bundy, 2002). They have utilized IT to provide more efficient instruction to beginning students, thus freeing librarians to develop advanced electronic information skills instruction for upper-level and graduate students (Fjällbrant, 2000a). Many other university libraries deliver information literacy courses. For example, at the Linköping University librarians and faculty have been experimenting for more than ten years with teaching students appropriate information skills (Rader, 2002a), at the Karolinska Institute information literacy is linked with problem-based learning and at Malmö University staff are working on integrating information literacy into the curriculum (Hepworth, 2000c: 26, Virkus, 2003).

Tovoté notes that the changes in learning and teaching during the 1990s have led to increased demands for broader and more varied sources of information at all levels of education in Sweden. Students are doing independent information searches in connection with their class assignments and the range of study aids has become more varied as well as the use of libraries for the purpose of teaching. The old system of handing out lists of required reading for each course is being replaced by a method where the students take responsibility for their own learning. She also

describes a special project at Malmö University attracting students from non-academic backgrounds and finding out if there was a need for a special pedagogical approach to their courses in information searching. This project was a great success, partly because of relationship marketing. There is now a programme aimed at the information literate student and conducted on different levels, from a pre-degree level to a doctoral level. The Higher Education Administration, who recently gave Malmö University the right to award Bachelor Degrees, mentions especially the ambitious IT support and the courses in searching, evaluating and handling information integrated into the subject areas, as an important quality factor when awarding this right. Tovoté also refers to a new distance education course called Communication for Development within the area of Arts and Communication where students can deepen the insight into their interaction between social development and information, communication and media, through both theoretical studies and through a specific project assignment in a developing country where the library has an important role (Tovoté, 2001: 5-7, Virkus, 2003).

Teaching information literacy is a rapidly growing activity also in **Danish** libraries. The Danish Electronic Research Library (DEF) initiative has influenced greatly information literacy developments in higher education. For example, together with the Faculty of Modern Languages, the Library at the Århus School of Business (LASB) is a partner in an innovative IT-project financed by the Danish Ministry of Education: *IT-reorganization project - Faculty of the Future!* (2001-2004). In this project LASB is acting as a learning and teaching support unit for IT-based presentation and dissemination of information as well as being the content provider concerning electronic course packages. Since 1998 LASB has cooperated closely with the faculty at the Århus School of Business on the integration of electronic library facilities into an e-Learning environment. As a result several flexible Web-based course packages have been developed in which the LASB has provided electronic library resources, cleared copyright materials, taught information skills and created IT solutions and platforms for the electronic course packages. Another project, METRO, a virtual learning resource centre using a metro map as a metaphor to guide students to valuable information and learning resources, was developed at the Århus School of Business as a joint venture between the Library and Faculty (Harbo, 2002; METRO, 2003, Virkus, 2003).

Several other examples of good practice should be noted. For example, at the Aalborg University Library a project titled MILE (Model for Information Literacy Education) was initiated, aiming to create and test a model for user instruction in information literacy, based on innovative pedagogy

and ICT. The product consists of a combination of multimedia or Web-based just-in-time tutorials, as well as live instruction integrated in the teaching/learning process (MILE, 2003). At the Royal Veterinary and Agricultural University, Denmark's Pharmaceutical University, the University of Southern Denmark, and the Technical University of Denmark, courses in information searching are part and parcel of credit-earning, compulsory subject courses. Examples of successful information literacy initiatives also include: the SWIM (Streaming Web-based Information Modules) project developed by the Aalborg University Library which use streaming-server technology where the tutorial enables the student to make a number of choices about search strategy and problem solving; the integration of information literacy into the curriculum at the Holstebro School of Occupational Therapy and Physical Therapy (Skov & Skærbak, 2003; SWIM, 2003); Roskilde University Library's Godin project on problem-based teaching of information searching (Trumpy, 2000); and several Web-based tutorials such as *Introduktion til informationssøgning* (Danmarks Tekniske Videncenter, 2003;and *InfoTutor* InfoTutor, 2003).

In Norway information literacy developments can be linked with medical and business schools with the increasing emphasis being on problem-based learning. For example, the University of Trondheim and the University of Oslo are good examples (Taylor & Krog, 2000; Haraldstad, 2002; Rasch & Trondsen, 2000). Bjorndal, *et al.*, (1999) also refer to a cooperation project between the University Library of Oslo University medical faculty, and the State Institute for Public Health, which involves the training of medical students in the use of electronic tools and critical evaluation of information. Hepworth (2000c: 26) notes that where problem-based learning takes place there is evidence to suggest that this encourages information literacy, or rather that information literacy is the key to problem-based learning (Virkus, 2003).

Audunson & Nordlie (2003) confirm that the institutions of higher education and their libraries have been in the forefront of information literacy development in Norway. There has been also a parallel trend towards a change from the traditional University or College library to a 'learning centre' or 'learning resource centre' and the transition from 'user education' to 'information competence development' (Virkus, 2003).

There are also several projects that connect research and practice. For example, at the University of Bergen a DIA-project examines information literacy in a broader context. The focus of this co-operation project, between the teacher training programmes for the sciences at the universities of Oslo and Bergen, was in teaching students to think more broadly about information gathering and processing, about search strategies and about evaluation of Internet resources. The project aims to

develop didactic models in applied education for the science teacher students as well as in information literacy by practising strategies of information-gathering about scientific controversies on the Internet (Tonning, 2002, Virkus, 2003).

Homann has given an extensive overview about the development of user education and information literacy in academic libraries in **Germany**. He highlights the orientation towards new pedagogic concepts and influence of the Anglo-American models of information literacy at the end of 1990s. Both the University of Heidelberg and the University of Hamburg have been experimenting with information literacy courses and online tutorials for several years. A modular teaching approach was developed at the University Library of Heidelberg and a 'Dynamic Model of Information Literacy' (*Dynamisches Modell der Informationskompetenz/DYMIK*) based on the Anglo-American models of information literacy was adapted to their library requirements. The library is considering integration in the new e-learning activities of the University and extension of information literacy courses. The project-oriented approach, including the use of individual thematic problems as starting points and integrating information literacy and learning was developed in the last few years at the Department of Library and Information at the Hamburg University of Applied Sciences. The teacher took a role of assisting on demand and an online tutorial *'Der schlaue Det'* was developed to offer the users additional support for self-testing and communication with the librarian (Homann, 2001; 2003). Modularised courses and activating teaching methods are now used in many university libraries in Germany. However, according to Homann (2001) most librarians are not qualified to take on teaching tasks. Therefore, courses on planning and realizing user education have been offered and regional meetings organized to share experiences. He also notes: 'Although there are a lot of activities, these are not the result of a systematic development but primarily the result of a lot of individual initiatives and it is not enough for a sustainable development' (Virkus, 2003).

Several information literacy initiatives in higher education can be followed on the basis of literature **in the Netherlands**. To support the current trends towards self-learning the University of Twente has developed the *Methodisch en Efficient Wetenschappelijke Informatie Zoeken* (MEEWIZ) (Methodical and Efficient Searching for Scientific Information) system. Through a series of six modules students are taught how to plan search strategies and to manage information. Users are directed to the different sources of information including patents, official documents and statistics. Use of interactive systems ensures that students' progress is monitored and guidance offered where appropriate. Reactions to the system are reported as being positive (Braaksma,

2000). The development of *DelftSpecial* (Student Personal Educational Coach for Information Alerting and Learning) started in 2001 in the University Library at Delft in collaboration with Utrecht University. DelftSpecial is a ICT-supported instruction programme in which students can learn how to use information both independently as well as embedded in an educational context. It enables students to learn how to formulate the query, to find information, to evaluate it and to determine the value of the information they find in connection with the relevant research domain. At the same time the programme offers several tools for storing and sharing information as well as for collaboration (Boekhorst, 2003). Hepworth (2000b: 31) also refers to the University of Maastricht 'study landscapes' created to facilitate problem-based learning and the incorporation of information literacy. These study landscapes included providing a place where students feel at home, where they can find the necessary learning resources, where they can study independently or in groups and where the learning resources in the study area are assembled with the specific group in mind. These resources were in addition to and separate from those found in the core collection. Information literacy activities of the library of Rotterdam's Erasmus University have also received attention and are referred to in the literature (Drenthe & van Elk, 2002).

The Faculty of Humanities at the University of Amsterdam also started in 1997 a compulsory module 'Information Literacy' for first year students. The module consisted of: computer skills, library skills, writing and oral presentations. These were undertaken on the basis of a central research problem derived from the student's subject and students had to formulate an answer, which led to a verbal presentation and a written report on the search procedure. Teaching was done in faculty-library partnership. In 2002 the module was renamed 'Academic Skills' and the module was split in two parts: Research and Argumentation (Boekhorst, 2003).

In Spain several universities offer optional credit courses within the curriculum for most degrees, free configuration credit courses for specialized documentation skills, and specific tutor support for final year students preparing their final dissertation. Examples of free-choice credit courses include those offered by the universities of Barcelona, Granada and the Polytechnic of Catalonia. Web pages of many academic libraries include tutorials and user guides to support information literacy, for example, at the *Universidad Carlos III in Madrid, Polytechnic University of Catalonia* and the *Open University of Catalonia*. More and more higher education institutions include specific user education and information skills courses within the curriculum for specific disciplines and degrees. A good example is the course 'Information Skills and Strategies' at the Universidad de Murcia (Gómez Hernández & Pasadas Ureña, 2003, Virkus, 2003).

According to Feo (1998) many information literacy initiatives took place from the early 1980s in several universities **in France**, encouraged by the ministry responsible for scientific and technical information. For example, in 1986 at the *University of Paris 8 (Universite Vincennes-Saint-Denis Paris 8)* an information methodology course was established which is now required in several university departments and over 1000 students take this course every year. Coulon (1999) also evaluates positively the impact of the teaching of information literacy courses at the same university. The *Service commun de la documentation* (SCD), the joint information service, at the University of Paris 4 (*Université Paris Sorbonne- Paris IV*) participates in the teaching of information skills for third year undergraduates and postgraduates. The role of the SCD can take different forms and the duration and content of courses vary from one faculty to another. However, two conditions are systematically met: the integration of the information component in disciplinary or methodological university teaching, and its adaptation to the specifics of each discipline. The objective is to educate students in the research and exploitation of information, so that they can profit from such courses in the preparation of their Master's thesis or higher diplomas (Fayet, 1999). However, Alava (1999) notes that despite research into the problem of student failure in French universities and official policies to foster information literacy, there has been little positive action to ensure academic success and social integration into the university (Virkus, 2003).

Nieuwenhuysen (2000) also reports information literacy initiatives **in Belgian** universities. He describes courses that are offered at the Vrije Universiteit Brussel (VUB) and at the Universitaire Instelling Antwerpen (UIA) which is part of the University of Antwerp (UA). The levels of the courses described are at the university third study year and Masters level. The need for a collaborative approach in offering online information literacy courses is emphasised (Virkus, 2003).

Sada refers also information literacy activities of the library of the Catholic University, Milan **in Italy**. She notes, however, that *'Italian university students do not really know what a library is, or what it can do for them.'* (Sada, 1999: 23). It is also interesting to note that she uses the term 'meta-competencies' described earlier, referring to information-related competencies (Virkus, 2003).

It should be also noted that in the former Eastern bloc countries, there are several programmes to teach students aspects of information literacy. Borovansky from the Arizona State University worked at the **Czech** Technical University in Prague in 2000 and assisted in the education of

engineers in using information resources. He reports serious efforts led by the few dedicated professional librarians to further improve the education of engineers and to increase their information literacy. At the Institute of Chemical Technology in Prague on the first level, most faculties (colleges) offer introductory courses for students. On the second, advanced level, the library offers specialised information courses. At the Technical University Brno the university administration has approved the introduction of a mandatory four hour information literacy course for all first year students. Two hours are devoted to introductory computing, while the other two hours are spent dealing with the use of computers in library/information applications. The staff of the Computing Centre teach the first part, librarians of the Central Library the second part. The proportion of the theoretical part to the practical one is two to one (Borovansky, 2000). Pejova from Slovenia in her paper for the UNESCO Expert Meeting also refers to well-organized information literacy education **in Estonia**: *'One example of advanced and well-pursued information literacy programs is Estonia, where there is strong information and library professional education.'* (Pejova, 2002: 5, Virkus,2003).

Conclusions

From this overview of the literature on information literacy activities around the world it is apparent that much work has been undertaken on the part of librarians to deliver information literacy. The initiatives outlined in this paper represent only some examples in what one might call 'information literacy movement'. Information literacy initiatives in higher education have taken a variety of forms: stand-alone courses or classes, Web-based tutorials, course-related instruction, or course-integrated instruction. Although during earlier years much of the teaching activities were separate from the curriculum, now there are trends towards the integration of information literacy into subject areas. Some discussions have taken place into the question of whether 'information literacy' should be taught as a separate unit or integrated into the curriculum, but the majority favour the curriculum integration model. Some institutions offer formal information literacy courses: these courses range from for-credit to non-credit, from required to elective.

There is also a shift towards increasing emphasis on faculty-librarian partnership and the implementation of modern ICTs in delivering information literacy courses. However, implementation and delivery of information literacy education depends on many factors: national as well as institutional policy, teaching and learning approaches, understandings and attitudes of faculty and students, and resources (budget, staffing, facilities, time). However, some specific characteristics of successful information literacy initiatives can be highlighted. Information literacy activities in several countries have been connected with the use of active learning methods, for

example, with problem-based learning methods which presuppose that the students themselves collect, document and analyse the information they need to solve a problem. There must also be effective partnership: formation of partnerships between library and faculty is of the utmost importance. Several publications as well as the Websites of many higher education institutions show that there are several initiatives under way. Collaborative approach seems to be appreciated, especially in Nordic countries. Successful initiatives report on integrated 'information literacy' programmes and the integration of the potential of modern ICT to deliver 'information literacy' education is also a common feature. The ACRL Information Literacy Competency Standards are being translated and used in several countries. Although some researchers do not favour these 'skills-based' and 'measurable' models, setting goals and having ways to assess whether students have met those goals is regarded as a good start.

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