Information literacy instruction
Theory and practice

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In the ever changing world of the present time students in schools and the general public as well need to be equipped with skills to be able to cope with the challenges of the rapid innovations in technology and communication and the rising globalization, because "new technological developments continue to alter the parameters of work, leisure, family life and citizenship" (Moscow Declaration, 2012) and solid education and science seem to be the main foundations of economic progress.

It is widely recognized, that information literacy (IL) – the ability to identify information need, seek, locate, critically evaluate and use information (Alexandria Proclamation, 2005, Prague Declaration, 2003) in an ethical manner – is among the cornerstones in education and underpins informed active participation in the information and knowledge society. In 2012 with the release of the Moscow Declaration on Media and Information Literacy (MIL) the new media was more clearly integrated into the official definitions of information literacy (Moscow Declaration, 2012).

Iceland does neither have a formal national policy on information literacy nor is information literacy strongly represented in the legislation for the upper secondary school or in the National curriculum guidelines for the secondary school (Thórarinsdóttir & Pálsdóttir, 2014). Therefore it is interesting to study the emphasis scholars and other nations place on information literacy for that school level and its instruction as well as the teaching methods and ideology used. Among others, the Big6™ program (Eisenberg & Berkowitz, 2000) is under consideration.

The purpose of the paper is to present and discuss theory of information literacy instruction and its implementation and the transfer into practice. Furthermore, best practices in the field are brought in and introduced. The methods used are a literature overview and content analysis. The objective of the study is to see if there is a difference between Iceland and other countries concerning the emphasis placed on information literacy and to draw conclusions from the findings.

Theory of information literacy instruction

Theories in information literacy instruction are intertwined with learning theories since acquiring information literacy competencies is a learning process. Information literacy, which requires critical thinking, is based on functional literacy and for example on computer literacy, digital literacy, media literacy, web literacy, information handling and information skills, visual literacy, civic literacy and critical literacy (see also SCOUNUL, 2011; Sturges & Gastinger; 2010). Several scholars have put forward differentiations of the facets of information literacy and tried to take the process apart for clarification, because information literacy is a multidimensional concept embedded in a social and cultural context. Social constructivism is today seen as the main theoretical base for information literacy. Todd (2000, p. 168) states “that new knowledge and meaningful learning results when a person consciously and explicitly ties new knowledge to relevant concepts and propositions already possessed”. Several models have been introduced on information literacy theories, learning and training in order
to clarify the concept and its facets. There are two main approaches for media and information literacy instruction, either as stand-alone courses or embedded in subject courses. Today information literacy is increasingly seen as "a social practice determined by culture and the context in which it is set" (Abdallah, 2013, 96) and the tendency is to integrate media and information literacy into subject courses (Virkus, 2013).

Transfer of information literacy into practice

As mentioned above several information literacy models have been developed and introduced for teaching and reinforcing the information searching and information using processes. The three following models of the research process are considered prominent ones (Brand-Gruvel, Wopereis & Walraven, 2009; Wolf, 2003). Kuhlthau presented her ISP model of the Information Search Process first in 1985; Stripling and Pitts put forward their thinking frame model in 1988 and Eisenberg and Berkowitz introduced in 1988 their Big6 program and learning model, here under consideration. Since then some other models based on information literacy have been designed, for example the Seven faces of information literacy model (Bruce, 1997), Horton’s (2008) Information literacy model and The seven pillars of information skills model (SCONUL, 2011). These models are well recognized and worth mentioning, however, it is outside the scope of this paper to introduce them (see Þórdís T. Dórarinsdóttir & Ágústa Pálsdóttir, 2011).

Kuhlthau’s ISP Model

One of the first of models of information literacy is Kuhlthau’s ISP model. Kuhlthau (1985a, 1987, 1993 & 2004) developed the following six-stage model of the information search process (ISP), in other words Kuhlthau’s ISP-model. She also researched and identified the feelings students are likely to experience along with strategies as well as their thoughts and actions that can lead them through a productive search. The model describes the information search process from the perspective of the user and is “derived from an intensive study of a group of high school seniors” (Kuhlthau, 2004, p. 51). In her research Kuhlthau also developed a principle of uncertainty, where “uncertainty due to lack of understanding, or limited construction initiates the process of information seeking” (Kuhlthau, 2004, 92). The full model shows also how users approach the research process and how their confidence increases as they proceed.

1. Task initiation – uncertainty
2. Topic selection – optimism
3. Pre-focus exploration – confusion/frustration/doubt
4. Focus formation – clarity
5. Information collection – sense of direction/confidence
6. Search closure/presentation – satisfaction or disappointment

Assessing the process was included as a separate stage (Kuhlthau (1985b). Later Kuhlthau (2004) incorporated some aspects of assessment in the sixth stage. Kuhlthau sees assessment as a time of reflection after the search process has been completed and the assignment accomplished; reflecting about what had taken place increased the students' self-awareness of the different stages in the process.

Together with her daughters Mainotes and Caspari Kuhlthau developed a new approach, the concept of learning through Guided Inquiry (Kuhlthau, Mainotes & Caspari, 2007) to meet the challenge of the 21st century to educate students for living
and working in an extremely information-rich technological environment. An instructional team (teachers and school librarians) “gradually leads students toward independent learning” where the “ultimate goal is to develop independent learners who know how to expand their knowledge and expertise through skilled use of variety of information sources employed both inside and outside the school” (p. 3). Moreover “the content of the curriculum is connected to the student’s world through thoughtful planning and adaptability” (Kuhlthau et al., 2007, 3).

Kuhlthau (1987) points out that using a timeline to describe the search process helps students to understand the time and effort involved in an extensive search and to plan the work accordingly. She also states that information gathering and use are not linear, “but rather complicated processes in which questions are continually changing and evolving as new information is collected and thought about” (Kuhlthau, 1987, p. 8). In developing her ISP-model Kuhlthau was influenced by Kelly’s personal construct theory which "focuses on the structure and function of how humans construe their experiences” (Reynolds, 2013, p. 68).

Bruce (1997) and Kuhlthau et al. (2007) place emphasis on making sense of information and its transformation into knowledge. Limberg’s findings (2000) show that learners’ interaction between information seeking and use are not independent of the content of the information used, in other words learners/students do not think about information seeking as separate element from the subject content of an assignment.

**Stripling and Pitts thinking frame model**

The model designed by Stripling and Pitts (1988) is a ten steps process, where a thinking framework is emphasized. The model can be adapted to any age level and curricular subject. The ten steps are as follows:

1. Choosing a broad topic.
2. Getting an overview.
3. Narrowing down the topic.
4. Developing a thesis or statement of purpose.
5. Formulating questions to guide research.
6. Planning research.
9. Establishing conclusions.
10. Creating and presenting the final product.

The model guides students through the stages of creating a research paper. Throughout the model are built-in reflection points, which provide reevaluation of the steps: “each step of the process includes study and thinking skills as well as teaching and learning strategies“ and furthermore „at critical points in the process, reflection points direct students to evaluate the work they have just completed” (Stripling & Pitts, 1988, 20).

**The Big6™ program and learning model**

Eisenberg and Berkowitz created the Big6™ program and learning model. They first introduced the Big6 (then Big Six) in their book Curriculum initiative. An agenda and strategy for library media programs, published 1988. The intention of Eisenberg and Berkowitz was to create “an effective tool for helping students learn the research process as an inquiry process” (Huges, 2003, 28). In 1990 Eisenberg and Berkowitz pursued the model further in the book Information problem solving. The Big Six skills approach to library & information skills instruction. Since then they have refined
the Big6 model and approach and added more conceptual depth and a wide range of practical tools for the program (Eisenberg, 2014). Eisenberg and Berkowitz also run an active website, (www.big6.com) where the users can for example get various support materials like hand-outs, presentations, video and guides. The Big6 is one of the most widely-known and widely-used approach to teach information and technology skills at all school levels (Basli, 2011; Eisenberg, 2014; Huges, 2003; Murray, 2008). The Big6 is an information and technology literacy model and curriculum, implemented in many schools, in primary and higher education as well as in corporate and adult training. It is sometimes called the Big6 an information problem-solving strategy, because with the Big6, the learners are considered to be able to handle any problem, assignment, decision or task (Eisenberg & Berkowitz, 1990, Eisenberg, 2001; Lau, 2007).

According to the Big6 Information & Technology Skills for Student Achievement Program information problem-solving is described in terms of the following six two part steps. The two sub-stages are part of each main category in the Big6™ model, where the individual stages are defined more exactly.

1. Task definition: Define the problem & identify information requirements.
2. Information seeking strategies: Determine range of sources & prioritize them.
3. Location and access: Locate sources then find information within the sources.
4. Use of information: Engage (read, view etc.) & extract relevant information.
5. Synthesis: Organize information from multiple sources & present information.
6. Evaluation: Judge the process (efficiency) & judge the product (effectiveness).

The learners go through the different stages, when they seek or apply information to solve a problem or make a decision. It is not necessary to complete the stages in linear order. But it is an approach that clarifies the problem at hand. The figure below shows clearly the adaptability and flexibility of the Big6 program: information-problem solving is not always a linear step by step process: “the stages do not need to be completed in any particular order or in any set amount of time” (Eisenberg, 2008, 42).

![Figure 1. The Big6 as a feedback process (Eisenberg, 2008, 42)](image-url)
The Big6 model is intended to foster the acquisition of both school library media specialists and classroom teachers (Wolf, 2003). It focuses on the process as well as the content and is applicable to all subject areas of the curriculum: “The Big6 skills are best learned when integrated with classroom curriculum and activities” (Eisenberg 2001). Various computer and information technology skills are integral parts of the Big6 skills. The program can also be used to prevent plagiarism (Story-Huffmann, n.d.); it can be addressed in step 4; Use of information. It is generally recognized that informative guidelines are among the best preventions of misconducting in scientific writings. Grögé (2014) states that “knowing how to avoid plagiarism and all the other misconducts in science is part of information literacy”.

Further one important feature of the Big6 is the emphasis on self-awareness or metacognition. Metacognition is “described as thinking about thinking” (Wolf, 2003). According to Wolf more specific definitions include references to knowledge and control of factors that affect learning, like “knowledge of the self, the task at hand and the strategies to be employed” (2003, 4). The learner must be aware of his/her own cognitive activities and be able to control and monitor the activities in order to perform metacognitively (Wolf, 2003). The Big6 can also serve as metacognitive scaffolding, which contributes to transferability of learning. Scaffolding is defined as “a support structure for learners engaged in activities just beyond their independent abilities” (Wolf, 2003, 5).

Library user education has been criticized for being more focused on “telling people about information sources and specific electronic tools” (Streatfield, Allen & Wilson, 2010) rather than being experimental and constructing learning experiences. Therefore it is desirable to expand library education and make it collaborative and include the components of information and media literacy and active interaction with the tasks at hand, for example in problem based learning, Guided Inquiry and in the Big6 as well.

**Teaching Information Literacy**

Today information technology affects everyone. Most businesses and organizations focus on meaningful uses of information technology and hire employees who are able to apply technology in an effective way. It is undoubtedly one of the responsibilities of the educational system to develop students who are not only technologically literate but also information literate. The students must learn how to use technology to solve information problems (Eisenberg, Lowe and Spitzer, 2004; Þórdís T. Þórarinsdóttir & Ágústa Pálsdóttir, 2011). In the Prague Declaration, it is stated that information literacy should “be an integral part of Education of All, which can contribute critically to the achievement of the United Nations Millennium Development Goals and respect for the Universal Declaration of Human Rights” (2003).

Familiarity with computers is becoming a prerequisite for most jobs and schools must prepare the students for the future by teaching the use of computers but competence with technology must be set within the context of information literacy. Being able to use computers is not enough. One has to be able to apply computer skills to real situations and real needs and must be able to identify information problems and locate, use, synthesize and evaluate information in relation to the problems at hand.

According to Eisenberg, Lowe and Spitzer (2004) there are the two following main pedagogical approaches or models for teaching technology which are included in information literacy:

a) **Technology as an object of instruction** (skills out of context approach), where computer science is considered as part of the curriculum for all students.
b) Using technology as a tool in preparing assignments (skills in context approach), where computer science is considered to be an inherent part of each subject.

Rather than teaching individual skills out of context as in the technology as the object of instruction approach, the technology as an integral tool model emphasizes the use of technology in context to accomplish goals and solve problems at hand, for example an assignment for a school subject, like geography or history, where information and media literacy is also included.

The process/skills in the context approach is becoming more widely supported as being consistent with current pedagogy and theories of learning and preparing students for lifelong learning. The focus is on learning with technology rather than learning about technology. The same applies for teaching information literacy; it is more effective to teach it in context than out of context (Eisenberg et al., 2004) and the embedded instruction described above seems also to apply to information literacy, in other words to integrate it in the different subjects as the Big6 program assumes rather than to teach it in standalone courses.

As early as in 1987 Kuhlthau argues for integrating information skills into the curriculum. Emphasis is placed on teaching “the information skills required to use resources effectively in the context of classroom learning, not as isolated library skills lessons” (Kuhlthau 1987, 12). The constructivist approach in information literacy instruction with emphasis on building on prior knowledge seems to be more fruitful. According to Limberg, Alexandersson, Lantz-Andersson & Folkesson, (2008) there is strong research evidence that information literacy skills are best developed within the learner’s (researcher’s) subject context. Eisenberg, Johnson & Berkowitz (2010) chime in with this view.

Information literacy instruction seems thus to be best served in cooperation and interaction between the students on the one hand and educators (subject teachers and information professionals) on the other hand, dealing with meaningful tasks and projects, which are credit-bearing and a part of the curriculum in a given subject.

Information literacy instruction programs

Information literacy instruction programs can consist of various methods (Cameron, 2004; Catts, 2000; Grassian & Kaplowitz, 2001):

1. Standalone information literacy instruction.
2. Discipline-specific or course-related information literacy instruction.
3. Self-paced workbooks to be completed within a given time.
4. Online tutorials.
5. Individual assistance.

All the models described above (Kulthau’s ISP Model, Stripling and Pitts thinking frame model and the Big6) are mainly designed for course related information literacy instruction. The models emphasize further the transferability of the skills acquired by using the models systematically in learning situations of each subject. Using the Big6 makes technology skills meaningful in subject settings. Crawford (2006) evaluated and compared several information literacy models including the Big6 which was chosen as the best one; for example because of its applicability, its user-friendly approach for teachers, students and parents, its extensive resources available, including lessons.

Bruce (2002) sees information literacy as a catalyst for educational change. It empowers the learners and gives them the capacity to engage in self-directed lifelong learning, since it brings real life experiences of information use into the classroom. Bruce (2002) also brings the following keys facilitating the adoption of information literacy education:
- Cultural change, change in educational values.
- Establishing policy and guidelines.
- Teacher education – staff development.
- Partnership between key personnel

Bruce (2002) states that all of the five foregoing areas are required to bring about change. The Icelandic upper secondary schools are now preparing new school curriculums for that educational level which gives the schools a good opportunity to bring about educational change and include information literacy explicitly in the school practice.

**Information literacy and best practice**

In a white paper with the title *Information literacy as a catalyst for educational change* prepared for UNESCO among others Bruce (2002) interprets best practice for information literacy as those approaches which,

1. interpret information literacy as integral to the learning process
2. bring learner centered, experimental and reflective approaches to the information literacy education process
3. bring collaborative approaches to program implementation
4. establish partnerships within and between organizations.

Each of the best practices is supported by arguments gained by research outcomes (Bruce, 2002). The Big6 program described above seems to meet the requirements put forward by Bruce.

**Information literacy around the world**

In many countries information literacy has been purposely integrated into the national curricula. Task force committees have been established and special groups have been engaged to pave the way for information literacy in the school system (Þórdís T. Þórarinsdóttir, 2010). *An International state of the art report* (Lau, 2007) reveals that the strongest promotion of information literacy seems to be, besides the United States, in Australia and New Zealand, Canada, the United Kingdom and Ireland and South Africa. Further the Netherlands can be mentioned. Of the Nordic Countries the most intensive activities appear to be in Finland and Sweden. There is no mentioning of Iceland. Bruce (2002) also mentions Singapore. It would be interesting to examine if countries that place emphasis on information literacy score higher on the PISA test.

It has been discussed if information literacy improves academic achievement. As early as 1995 Todd identified that in Australian schools that possessed information literacy skills scored better on assessment criteria in exams. Limberg (1998) got similar research outcomes concerning Swedish students.

Bruce (2002, 11) points out that “international, national and institutional guidelines and policies can direct and support adoption of information literacy education”. Willer and Eisenberg (2014) state that a wide variety of authorities have called for information literacy to be incorporated into educational standards, both in the United States and in Europe, since it is important that students have solid grounding in information problem-solving, in other words in the application of information skills.

Many components of information literacy standards relate directly to the steps of the Big6 (Story-Huffman, 2008). Willer and Eisenberg (2014) conducted a research on
mapping American educational standards to the Big6 and found out that the first step, Task definition, which they consider the most important phase of problem-solving, and step six, Evaluation, were the two least represented steps in the American standards under consideration and recommended to reform the standards in accordance with the research outcome.

Information literacy in Iceland

In 1995 information literacy (upplýsingalæsi) was for the first time mentioned in Icelandic. Relatively little has been published on the subject in the country (Þórdís T. Þórarinsdóttir, 2010). A formal national information literacy policy or standards have not yet been developed. In latter editions of the information policy of the Icelandic Government not much emphasis is placed on information literacy; the main focus is on information technology. In the current legislation for the secondary school media and information literacy is not explicitly considered. Contrary to many other countries little emphasis is placed on information literacy in the general national curriculum guidelines (Aðalnámskrá) and that is in accordance with the little emphasis on the subject in the information governmental policy papers. A positive development can be observed in the latest edition of the national curriculum guidelines for the elementary school. Hopefully comparable progress for the secondary school will follow (Thórarinsdóttir & Pálsdóttir, 2014; Þórdís T. Þórarinsdóttir, 2010). A study conducted in 2014 among library directors in upper secondary schools (n=33) with a response rate of 87.9% revealed that information literacy is not strongly represented within Icelandic educational legislation and policy papers. The survey revealed that information literacy is not very often included in the learning outcomes of course descriptions and 48.1% of the respondents claimed that not at all enough emphasis is placed on information literacy in the schools. This corresponds to its weak and unsystematic representation in the legislation and other government policy documents (Thórarinsdóttir & Pálsdóttir, 2014).

Conclusions

The objective of this study was to show if there is a difference between Iceland and other countries concerning the emphasis placed on information literacy and to draw conclusions from the findings. The observation revealed that many international, national and institutional standards have been developed on information literacy, but Iceland does neither have a formal national policy on information literacy nor is information literacy strongly represented in the legislation for the upper secondary level or in the National curriculum guidelines for the secondary school (Aðalnámskrá, 2011). This is in accordance with the latter editions of the information policy of the Icelandic Government where not much emphasis is placed on libraries and information literacy (Thórarinsdóttir & Pálsdóttir, 2014; Þórdís T. Þórarinsdóttir, 2010).

The information literacy models introduced emphasize that information literacy education is connected to the content of the curriculum, in other words to the different subjects. The emphasis is on implementing a meaningful information literacy program in context. The Big6 model appears to be the most accessible of the models under consideration. The strengths of Big6 is its flexibility, that it encourages metacognitive activities in the student, that it supports transferability among subjects and information problem-solving situations; further can the program be adapted and applied to all school levels, erge also for the upper secondary level in Iceland. Eisenberg strongly advocates for a collaborative approach to information literacy
instruction that “classroom teachers, librarians, technology teachers and other educators can work together” and design curriculum and lessons where information skills and classroom content is integrated (Eisenberg, 2008, 45). It would be desirable to develop Icelandic information literacy standards for all school levels and introduce the use of the Big6 with the goal to develop independent learners and citizens.

It is appropriate to close with the following words of Eisenberg: “Information literacy is fundamental and essential. There is nothing more important or basic to learning and living than information literacy” (Eisenberg, 2014, 10).

References


SCONUL (Society of College, National and University Libraries). (2011, April). *The SCONUL Seven pillars of information literacy. Core model for higher education.* Prepared by the SCONUL Working group on information literacy, on behalf of SCONUL. Retrieved from [http://www.sconul.ac.uk/groups/information_literacy/seven_pillars.html](http://www.sconul.ac.uk/groups/information_literacy/seven_pillars.html)


