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INFORMATION LITERACY AS A BASIC SKILL IN INFORMATION SOCIETY

1. Introduction

Information literacy is a very important skill because we are living in a world which contains abundance of ways of getting information. In the new stage of economic and social development called "information society," there is no problem not having enough information, it is just the opposite – too much information. We are bombarded with a constantly increasing amount of information, and such a high rate of growth has never been experienced before.

This increasing problem of large quantities of information in life is generally called information overload. "There is no universally agreed upon definition of information overload – it can mean several things, such as having more relevant information than one can assimilate or being burdened with a large supply of unsolicited information, only some of which may be relevant" [Galewski, Kuśmierczyk 2008].

There are also many other synonyms of information overload that are used in the literature: data smog, data glut, infoglut, information explosion, data overload, analysis paralysis, information fatigue syndrome.

There were some attempts to measure the amounts of information in the world. Probably the most known study in this area is the report: "How much Information? 2003" released by the School of Information Management and Systems University of California, Berkeley. According to the results of this study [Galewski, Kuśmierczyk 2008]:

- print, film, magnetic, and optical storage media produced about 5 exabytes of new information in 2002. 92% of the new information was stored on magnetic media, mostly on hard disks,

- the World Wide Web contains about 170 terabytes of information on its surface, in volume this is seventeen times the size of the Library of Congress print collections,
- e-mail generates about 400,000 terabytes of new information every year worldwide,
- information flows through electronic channels – telephone, radio, TV, and the Internet – which contained almost 18 exabytes of new information in 2002, three and a half times more than is recorded in storage media,
- the United States produces about 40% of the world's newly stored information, including 33% of the world's new printed information, 30% of the new world's film titles, 40% of the world's information stored on optical media, and about 50% of the information stored on magnetic media.

In these conditions an access to the appropriate amount of information has become crucial. "Information literacy has been suggested as a way to deal with information overload." It involves "critical thinking, an awareness of personal and professional ethics, information evaluation, conceptualizing information needs, organizing information, interacting with information professionals and making effective use of information in problem-solving, decision-making and research" [*Information Literacy...* 2006].

2. Definition of information literacy

Usually literacy means the ability to read and write, but there is a variety of types of literacy. There is audiovisual literacy, print literacy, computer literacy, media literacy, web literacy, technical literacy, functional literacy, library literacy, information literacy, etc. [Ranaweera]. There are also numerous definitions of information literacy, for example the American Library Association (ALA) states that information literacy is the ability to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" [Ranaweera]. According to ALA, information literacy is the restructuring of the learning process which would actively involve students in the process of [Snavely, Cooper 1997]:
- knowing when they have a need for information,
- identifying information needed to address a given problem or issue,
- finding needed information,
- evaluating the information,
- organizing the information,
- using the information effectively to address the problem or issue at hand.

The Association of College and Research Libraries (ACRL) declares that information literacy is a "fusion or integration of library literacy, computer literacy, media literacy, technological literacy, critical thinking, ethics, and communication skills" [Rockman]. According to ACRL information literacy is the basis of lifelong

learning and it helps learners to become self-directed. An information-literate individual is able to:

− determine the extent of information needed,
− access the needed information effectively and efficiently,
− evaluate information and its sources critically,
− incorporate selected information into his or her knowledge base,
− use information effectively to accomplish a specific purpose,
− understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally.

According to other researchers an information literate person is one who [Kumar et al. 2005, pp. 50-60]:

− recognizes that accurate and complete information is the basis for intelligent decision making,
− recognizes the need for information,
− formulates questions based on information needs,
− identifies potential sources of information,
− develops successful search strategies,
− accesses sources of information including computer-based and other technology,
− evaluates information,
− organizes information for practical application,
− uses information in critical thinking and problem solving.

All these definitions confirm that information literacy is a necessary skill that helps reduce the information overload problem and allows us to filter out information we do not need. So, information literacy is the basic skill for people in information society and, as P. Drucker said, "being able to use a computer is not enough. Executives must be able to apply computer skills to real situations and needs. Executives must be able to identify information problems and be able to locate, use, synthesize, and evaluate information in relation to those problems" [Eisenberg 2008, pp. 39-47].

3. Models of information literacy

When information literacy became more a famous concept, many models of information seeking and analysis were developed. "Earlier models of information retrieval focused on the representation, storage and systematic retrieval of information or on information systems. However, the current view of information seeking and analysis emphasizes understanding, reflection and communication based upon the needs, characteristics and actions of information seekers". A few models will be presented below [Kumar et al. 2005, pp. 50-60].

Kuhlthau's information search process model – a model focused on the information search process from a user's perspective. In this model there are six steps which students undergo in an information seeking task:

– task initiation – in this phase a student recognizes the information needs,
– topic selection – a student chooses the initial general topic to be investigated,
– pre-focus exploration – the information gathered is general,
– focus formulation – a student chooses particular focus of the information and forms one focused topic,
– information collection – a student gathers more information on the focused topic by interacting with the information system effectively and efficiently,
– search closure and presentation.

Marchionini's information seeking process model – the 8-step model contains:
– recognition of an information problem,
– defining and understanding the problem,
– choosing a search system,
– formulating a query,
– executing the search,
– examining the results,
– extracting information,
– reflecting/iterating/stopping.

Ellis' information-seeking behaviour model – this model describes six steps of information searching activities:
– starting – identifying sources of interest,
– chaining – following up activities on references from a particular article or other forms of referential connection between materials,
– browsing – activity of semi-directed search in areas of a potential search,
– differentiating – selecting from the sources scanned by noticing differences between the nature and quality of the information offered,
– monitoring – the individual is aware of development in an area by regularly following up particular sources,
– extracting – working through a particular source or sources in order to identify the material of interest.

Big6 model – model produced by Eisenberg and Berkowitz, one of the most well known models in the field being taught widely to students. This model links information problem-solving and critical thinking. Big6 basically involves:
– a systematic approach to information problem-solving,
– a complete library and information skill curriculum,
– six broad skill areas necessary for successful information problem-solving:
    1 – task definition
        1.1 – define the problem,
        1.2 – identify information requirements;
    2 – information seeking strategies
        2.1 – determine the range of sources,
        2.2 – prioritize sources;

3 – location & access
    3.1 – locate sources,
    3.2 – find information;
4 – use of information
    4.1 – engage,
    4.2 – extract information;
5 – synthesis
    5.1 – organize,
    5.2 – present;
6 – evaluation
    6.1 – judge the product,
    6.2 – judge the process.

3. Comparison of information literacy models

All these models are built for seeking information when students, or other users, realize that they have an information problem. The strong point of Kuhlthau's model is that it focuses on a range of emotions such as confusion, anxiety, doubt and disappointment. Another advantage of this model is specifying processes such as brainstorming, discussing, predicting, listing, combining, etc. But, Kuhlthau's model has also some disadvantages, one of them is the lack of higher level cognitive actions such as organization, manipulation and synthesis of information which can integrate new information with the rest of the user's knowledge.

The model of Marchionini "more accurately identifies the information seeking cycle as being iterative and recursive" [Kumar et al. 2005]. Kuhltau and Ellis underline that the information seeking process is a linear and sequential activity.

The constraint of the Big6 model is that it has to be integrated with the classroom curriculum and the teachers play a significant role in the information seeking process. "The approach taken is to use the Big6 as a framework for teaching the course content. They analyze the curriculum from a Big6 perspective and then design Big6 strategies to help students learn the content of the course and express their knowledge through writing, projects, and exams" [Kumar et al. 2005].

The next part of this article will present the results of the Project Information Literacy's research conducted in colleges and universities in the USA whose aim was to find out how students carry out their information seeking processes.

4. Project Information Literacy's Report

Project Information Literacy was a national research study based in the University of Washington's Information School. The goal of this study was to understand how students conduct their research activities, both course-related and

"everyday use." The authors defined "course-related research" as activities needed to write a 5-7-page argument paper for the humanities and social sciences. "Everyday life research" was defined as information seeking strategies for solving daily life problems, such as health and wellness, finance and commerce, news, career, politics, etc.

Preliminary findings (the study is still ongoing) allow to state that the research seems to be far more difficult to conduct in the digital age than it did in previous times. Whether for course assignments or everyday life problems, the research is a challenging activity and involves much frustration, mainly because students know that resources exist somewhere, but cannot be found. The reasons for this situation are presented in Table 1.

Table 1. What frustrates students when they conduct research?

Course-Related Research	Everyday Life Research
• Information overload (e.g., the more you know the less you know, it is depressing). • Too much irrelevant information, cannot locate what is needed from online results. • Beginning and getting started on an assignment. • Trying to find the "perfect source." • Not knowing what to look for, yet still sifting through articles that might fit. • Trouble finding books needed on library shelves. • Can find the citation online, but cannot find the full-text article in a database. • Scholarly databases or library books are out of date. • Finding statistical information online. • Having to change and refine how to write a research paper from class to class. • Not having access to the same materials as professors (e.g., rare documents). • Having to buy a source unavailable on Campus. • Trying to find the .05% of things of interest not on the Web. • Feeling that nothing new is being said and feeling like the same information is given again and again. • Conducting research to meet another's expectations.	• Too many results from a Google search and the need to sort through them. • Knowing the "answer" is online, but not being able to find it. • Figuring out what is a credible source and what is not. • Figuring out if something is up to date. • Knowing that everything is not online, especially when searching the Web. • Can never find enough information on the obscure topic being searched. • Once a great source is found online, how is it found again when it is needed? • Do not have a computer at home, so online searches for information involve some travel.

Source: [Head, Eisenberg 2009].

The results of the study show that the keyword for all research problems is "context." Finding the context turned out to be the most laborious part of the

research process and this explains why the research is so complicated for undergraduates.

Based on sessions across campuses, scientists came out with a type of research contexts needed by students. They have identified four types of contexts that students may seek.

1. Big picture context – selecting and defining a topic, limiting its scope, understanding multiple sides of an argument. This context is much more needed for course-related research than for everyday life ones.

2. Language context – becoming more comfortable with the language, terms and discourse of a topic area.

3. Situational context – setting the parameters of a topic, especially how efforts may fit into expectations and a set of surrounding circumstances. For everyday life research situational context was defined in terms of the need to know for personal gratification, curiosity, etc., while course-related research involved meeting the expectations of someone else – instructor, professor, etc.

4. Information-gathering context – finding, accessing and securing relevant resources that satisfy individual research needs.

Every context is needed in different degree of intensity, depending on the type of research (course-related or everyday life) and the level of students' engagement.

Students have their own strategies and workarounds for resolving the difficulties of obtaining certain kinds of contexts. They can be formulated as two main solutions: using libraries and a self-taught online method.

Libraries are valued mainly for their online library start page (which can be used off-site as a gateway to scholarly research database) and for librarians as "navigational sources" and "information coaches." Regarding the on-line methods, a unique and indispensable research source for students is Wikipedia. Students described it as their "first to go place" as it can be used to obtain the "big picture" and "language context."

The preliminary results of the study show that students are challenged, confused and frustrated because of information overload and being inundated with resources. They also have difficulties traversing a vast and ever-changing information landscape. The types of context proposed by the researchers should help to give a deeper understanding of the student research process. This may be the basis for identifying and narrowing gaps between the types of research conducted by students and by faculty – the aim would be to make recommendations for faculty and librarians on how to support students in their research process.

5. Conclusions

In the information society where new technology such as the Internet changed the way of gaining and processing information, users need the new models of

information seeking and they have to be information literate. Internet and other technology caused the information overload phenomena and it is no longer a problem of getting enough information but getting by with the enormous amounts of information.

Schools should choose one of the presented models of information literacy and incorporate it as a part of the educational systems. "Information literacy helps students to identify whether the information they find is relevant to their research, whether the source is authentic, and also to accept or reject the viewpoints they encounter from various data sources with the tools of scientific inquiry and rationale reasoning" [Kumar et al. 2005].

Project Information Literacy's report showed that students have a lot of problems with conducting their research and it would be very useful for them to have some information skills.

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